Report No.
ADST/WDL/TR-93-W003250

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Advanced Distributed

Simulation Technology

METHODOLOGICAL LESSONS LEARNED IN THE HORIZONTAL INTEGRATION SIMULATION EFFORT

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Contract No. ~~N1339-91-001-0009~~
N61339-91-D-0001

January 1994

Prepared for:

U.S. Army Simulation, Training and Instrumentation Command
Naval Training Systems Center
12350 Research Parkway
Orlando, FL 32826-3275

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (*Leave blank*)

2. REPORT DATE
1/31/94

3. REPORT TYPE AND DATES COVERED
Final Report 9/29/93 - 1/31/94

4. TITLE AND SUBTITLE
Methodological Lessons Learned in the Horizontal Integration Simulation Effort

5. FUNDING NUMBERS
N61339-91-~~001-0009~~ D-0001

6. AUTHOR(S)
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8. PERFORMING ORGANIZATION REPORT NUMBER
ADST/WDL/TR-94-W003250

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
STRICOM
Simulation, Training and Instrumentation Command
Naval Training Systems Center
12350 Research Parkway
Orlando, FL 32826-3275

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE
A

13. ABSTRACT (*Maximum 200 words*)
This report documents the methodological lessons learned in conducting the Horizontal Integration (HI) Experiment using Advanced Distributed Simulation Technology (ADST). The experiment was conducted concurrent with the train-up of Task Force 1-70 of the 194th Armored Brigade (Separate) for their upcoming rotation at the National Training Center. Selected combat vehicles of the task force were equipped with Intervehicular Information Systems (IVIS) and Brigade and Below Command and Control (B2C2) systems, as well as the Digital Message Device. Using interactive simulation facilities at Fort Knox, Kentucky, crews conducted simulated combat scenarios using M1 and M2 vehicle simulators equipped with IVIS, IVIS emulator systems, Lightweight Computer Units (LCUs) with B2C2 software, B2C2 simulators, and actual DMD units. The lessons learned regarding software development, technical support, and training support provide important information for the planning, preparation, and conduct of future exercises using virtual environments.

14. SUBJECT TERMS
Distributed Interactive Simulation, Horizontal Integration, ADST, IVIS, B2C2

15. NUMBER OF PAGES
252

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18
298-102

ACKNOWLEDGEMENTS

The U.S. Army Armor Center, Fort Knox, Kentucky, provided extensive support of the Horizontal Integration simulation effort. From the Mounted Warfighting Battlespace Lab, MAJ Clyde ("Tom") Wilson, CPT John Keeter, and Ms. Mary Stafford fully supported the planning and execution of the study. Personnel from the Center's Directorate of Combat Developments included MAJ Larry Hu, CPT David Branscom and Mr. Ken Baughman, who participated in planning and preparing for the project. In addition, MAJ Robert Riffle and CPT Robert Kewley, of Task Force 1-70, 194th Armored Brigade (Separate), provided coordination with troop unit elements.

In addition to the authors, the BDM Federal, Inc. research staff included Mr. Timothy Voss. Research Assistants supporting the project included Mr. Daniel Schultz, Mr. David Johnson, Mr. Pete Wager, Mr. Charles West, and Mr. Kenneth Fergus.

Supporting the project from Loral Systems Company were Mr. Jorge Cadiz, Mr. Steve Farrow, and Mr. Ed Stadler. From the Loral Advanced Distributed Simulation company, Mr. Randall Kubik, Mr. Charles Kuczaj, and Mr. Paul Monday supported planning and execution. Personnel of the on-site support contractor, Loral Training and Technical Services, supported simulation operations and maintenance. These included Mr. Jimmy Adams, Mr. Fred Brady, Mr. David Clippinger, Mr. Ronald Fackler, Mr. Michael Krages, Mr. Thomas Radgowski, Mr. Rob Smith, and Ms. Lynda Wulf.

LinCom Corporation personnel provided software development and maintenance support throughout the project: Mr. Felix Balderas, Mr. David Cefaratti, and Mr. Stephen Mueller. In addition, Ms. Ann Davies and Ms. Barbara Osbon, of Oasis, Inc.; Mr. Jose Alonso, of I-Net, Inc.; Dr. James Helm, of Science Applications International Corporation; and Mr. Chris Marsh, of Mitre Corporation supported development of software.

EXECUTIVE SUMMARY

BACKGROUND

The Horizontal Integration Experiment was part of an ongoing project conducted under the direction of the Mounted Warfighting Battlespace Lab (MWBL) at Fort Knox, Kentucky. This effort supports the MWBL's Advanced Warfighting Demonstration of Battlefield Synchronization, which investigates the use of digital command, control, and communications (C^3) technologies in selected combat vehicles within a tank heavy battalion task force. The project will culminate in a National Training Center (NTC) rotation of the subject task force. Within the simulation, the task force used actual and surrogate digital C^3 devices, and Advanced Distributed Simulation Technologies (ADST) as a training vehicle for the upcoming NTC rotation.

This report documents the methodological lessons learned from the ADST support effort. The MWBL will report the operational, performance-based findings of the ADST phase in a separate report. This report is therefore limited to such areas as software development, training and training development, scenario development and execution, and technical support of the simulation.

METHODS

Task Force 1-70 of the 194th Armored Brigade (Separate) participated in a series of training exercises in October and December, 1993, using M1, M1A2, and M2/M3 simulators and supporting simulation equipment at the Mounted Warfare Test Bed (MWTB) and Mounted Warfare Simulation Training Center, both at Fort Knox, Kentucky. All simulations were conducted on the NTC terrain database, using scenarios representative of a typical rotation. Throughout the ADST-based training, the task force used a combination of surrogate and actual Intervehicular Information System (IVIS) and Brigade and Below Command and Control (B2C2) platforms, mounted in selected simulator and table-top configurations. Task Force fire support teams also used actual digital message devices for the execution and coordination of fire support. The task force was augmented with conventional simulators and semiautomated forces (SAFOR) to model the expected mix of IVIS/B2C2 equipped and conventional combat vehicles anticipated during the NTC rotation.

A significant software development effort was mounted to develop IVIS emulator software and translation software to implement an interface between the IVIS communications protocols and those used within the surrogate B2C2 system. In addition, existing NTC databases had to be installed on new vehicle simulator and desktop platforms. This step required special processing of the database before it could be installed on selected simulators. Prior to the simulation, selected members of the task force were to be trained on the surrogate B2C2 systems, and on unique aspects of MWTB simulators. This support requirement also included a modest training development and training support effort preceding the actual experiment. A limited functional test was conducted of the simulation network, sampling all software and hardware configurations, in order to verify the performance and interoperability of all systems.

A final task of the support effort was to assist in developing measures of performance to support data collection, and to conduct initial data processing.

METHODOLOGICAL LESSONS LEARNED

The lessons learned from the simulation support effort provided a wealth of information that is useful to researchers investigating digital C^3 or using ADST as a vehicle for operational research and development. Limitations with voice communications networks, the simulation network, and the capabilities of basic simulation equipment such as computer image generators exhibited a need for more reliable and robust systems. Terrain database compatibility and scenario design problems limited the responsiveness of SAFOR systems. Incompatibilities between the varied digital systems constrained data transfer and led to system malfunctions. The need for individual familiarization training was reinforced as remedial training was required for some participants regarding IVIS operation. Several ways to improve scenario development, coordination, and implementation were gleaned from the experiment, as were potential improvements to simulation support procedures. Finally, the data reduction and processing effort revealed possible ways to improve or streamline the process.

RECOMMENDATIONS

The lessons learned from the support effort yielded a number of recommendations applicable to both battlefield digitization research in general, and to ADST procedures. Recommendations are offered regarding strategies to investigate digital C^3 research in both the ADST environment and the field. Recommendations regarding ADST procedures address potential improvements to planning and preparation, functional testing, training, scenario support, support staff training, and exercise preparation, as well as recommendations to enhance the test bed's capabilities.

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ACRONYMS (Continued)

GDLS	General Dynamics Land Systems
GPS	Global Positioning System
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HI	Horizontal Integration
HMMWV	High-mobility, Multipurpose Wheeled Vehicle
IDC	Interactive Device Control
ITRANS	IVIS Translator
ITV	Improved TOW Vehicle
IVIS	Intervehicular Information System
IVIS-E	Intervehicular Information System Emulator
LAN	Local Area Network
LCU	Lightweight Computer Unit
LRF	Laser Range Finder
LOGEX	Logistics Exercise
MCC	Management, Command, and Control
METT-T	Mission, Enemy, Terrain, Time, and Troops
MRB+	Motorized Rifle Battalion (Plus, or Augmented)
MRC	Motorized Rifle Company
MRP	Motorized Rifle Platoon
MRR	Motorized Rifle Regiment
MWBL	Mounted Warfighting Battlespace Lab
MWSTC	Mounted Warfare Simulation Training Center
MWTB	Mounted Warfare Test Bed
NTC	National Training Center
OPFOR	Opposing Forces
OPORD	Operations Order
POC	Point of Contact
PVD	Plan View Display
RF	Radio Frequency
R RIU	Radio Interface Unit
RTO	Radio Telephone Operator
SAB	Separate Armor Brigade
SAFOR	Semiautomated Forces
SCC	SIMNET Control Console
SICPS	Standard Integrated Command Post System
SIMNET	Simulation Network

ACRONYMS

AAR	After Action Review
ADA	Air Defense Artillery
ADST	Advanced Distributed Simulation Technology
AFATDS	Advanced Field Artillery Tactical Data System
APDS	Armor Piercing Discarding Sabot
ARI	Army Research Institute
B2C2	Brigade and Below Command and Control
BCV	Battle Command Vehicle
BFV	Bradley Fighting Vehicle
BLUFOR	Blue Forces - Friendly Forces
C^2	Command and Control
C^3	Command, Control, and Communications
CAS	Close Air Support
CB	Citizens Band Radio
CCD	Command and Control Display
CEC	Combat Engineer Console
CID	Commander's Integrated Display
CIG	Computer Image Generator
CITV	Commander's Independent Thermal Viewer
CPU	Central Processing Unit
CRP	Combat Reconnaissance Patrol
CSOP	Combat Security Observation Point
CTCP	Combat Trains Command Post
CVCC	Combat Vehicle Command & Control
DCA	Data Collection and Analysis
DID	Driver's Integrated Display
DIS	Distributed Interactive Simulation
DMD	Digital Message Device
DO	Delivery Order
DVG	Digital Voice Gateway
ECR	Exercise Control Room
FIST	Fire Support Team
FIST-V	Fire Support Team-Vehicle
FSE	Fire Support Element
FO	Forward Observer
FOD	Forward Operating Detachment
FSO	Fire Support Officer

ACRONYMS (Concluded)

SINCGARS	Single Channel Ground and Airborne Radio System
SME	Subject Matter Expert
SOP	Standing Operating Procedures
TAA	Tactical Assembly Area
TACFIRE	Tactical Fire Direction
TF	Task Force
TIS	Thermal Imaging System
TOC	Tactical Operations Center
TOW	Tube-launched, Optically-tracked, Wire-guided Missile
XO	Executive Officer
USAARMC	U.S. Army Armor Center
VCR	Video Cassette Recorder
WS	Workstation
1SG	First Sergeant

mation. In line with this new thrust, the MWBL has the lead in digitizing mounted combined arms at brigade and below, leveraging current technology to enhance future battle command systems. The HI Experiment described in this report grew out of earlier efforts assessing battlefield synchronization in the simulation environment and in the field (see Courtright, et al. [1993] and Goodman [1993]). Because of the advantages inherent in advanced simulation capabilities, the experiment was conducted using Distributed Interactive Simulation (DIS) facilities at Fort Knox.

The HI Experiment was designed to capitalize on the organic training activities of the 194th Armored Brigade (Separate) at Fort Knox, Kentucky. Indeed, a major goal of the project was to support the train-up of the brigade's TF 1-70 as it prepared for its April 1994 rotation at the NTC. The DIS environment afforded excellent opportunities for the TF to gain valuable practice using digital technology in unit configurations planned for the NTC rotation.

DIS capabilities support cost-effective combat simulations using qualified crews operating selective-fidelity vehicle simulators on synthetic terrain. Building on earlier Simulation Networking (SIMNET) technology, the DIS program incorporates a variety of simulators supported by site-specific microprocessors and connects them by means of local and long-haul networking. By combining manned vehicles with semiautomated forces (SAFOR), combat units at the battalion level and higher can battle opposing forces (OPFOR) under doctrinally-based conditions. This enables combined arms elements from physically dispersed sites to perform together on common terrain and conduct realistic mounted warfare operations. These simulated combat capabilities provide a powerful tool for investigating new warfighting concepts and technologies.

Under the ADST delivery order mechanism, the ADST contract team supported the planning, preparation, and execution of the HI Experiment. The scope of the support activities encompassed software and hardware development, functional testing of simulation capabilities, development of implementing materials, operational support of simulated combat exercises, and collection and reduction of automated performance data. There were three stages of the HI Experiment: platoon, company team, and task force level training.

1.5 DESCRIPTION OF SIMULATION SYSTEMS

The HI Experiment incorporated generic ADST systems in a DIS environment. ADST incorporates manned simulators, semiautomated forces, and combat support simulations linked on a common Ethernet to allow realistic, force-on-force combat simulations. Current ADST systems are based on SIMNET technology. A detailed description of the basic system capabilities can be found in the *SIMNET User's Guide* (U.S. Army Armor School, 1989).

Fort Knox currently has two separate simulation facilities: the Mounted Warfare Simulation Training Center (MWSTC) and the Mounted Warfare Test Bed (MWTB). The MWSTC is used primarily for training M1 tank and M2 Bradley Fighting Vehicle (BFV) crews. The MWSTC has a total of 41 M1 tanks and 13 M2 BFVs. Additionally, this facility contains two Tactical Operations Center (TOC) "shells" with citizen band (CB) radio communication to the manned simulators.

CHAPTER 1
INTRODUCTION

1.1 SCOPE OF REPORT

This report documents the methodological lessons learned in conducting the Horizontal Integration (HI) Experiment using Advanced Distributed Simulation Technology (ADST). The report also summarizes the methods used to accomplish the experiment. The lessons learned draw on the observations and opinions of the contractor research support staff. The Mounted Warfighting Battlespace Lab (MWBL), U.S. Army Armor Center (USAARMC) is preparing the primary report documenting the performance findings of the experiment. This lessons learned report is designed to complement the MWBL report.

1.2 AUTHORIZATION DOCUMENTS

The following documents established the basis for the ADST HI Experiment:

Statement of Work for Horizontal Integration (Battlefield Synchronization), 23 August 1993.

Operation Desert Hammer VI Evaluation Plan (Draft), 1 December 1993.

1.3 OBJECTIVES

The ADST HI Experiment was designed as part of an Advanced Warfighting Demonstration of Battlefield Synchronization. The purpose of the simulation experiment was to demonstrate the benefits to lethality, survivability, and battle tempo of horizontally integrated digital communications technology within a combined arms task force. The effort supported the train-up of Task Force (TF) 1-70 for their April 1994 National Training Center (NTC) rotation. The principal research goal was to examine issues related to the combat payoffs and battle return on investment realized with digital capabilities supporting battalion/task force combat operations.

The contractor support objectives were to:

- Develop and test selected hardware and software required to implement the HI Experiment.
- Support the preparation of implementing materials, including the simulator network allocation plan, radio network plan, and electronic scenario files.
- Support the execution of simulated combat exercises, to include initializing and maintaining simulation network elements, operating simulation control stations, operating semiautomated forces, and documenting hardware/software problems.
- Support the collection and reduction of automated performance data.
- Document the methodological lessons learned during the execution of the experiment.

1.4 BACKGROUND

Recent Army emphasis on digitizing the battlefield and synchronizing combat activities has set the stage for investigating horizontal integration of the battlefield. This emergent concept refers to integrating diverse elements of combined arms forces by means of rapid dissemination/exchange of combat-critical information. This is accomplished by utilizing portable computers, high-speed networks transmitting digitized data, and advanced displays for presenting highly processed and integrated infor-

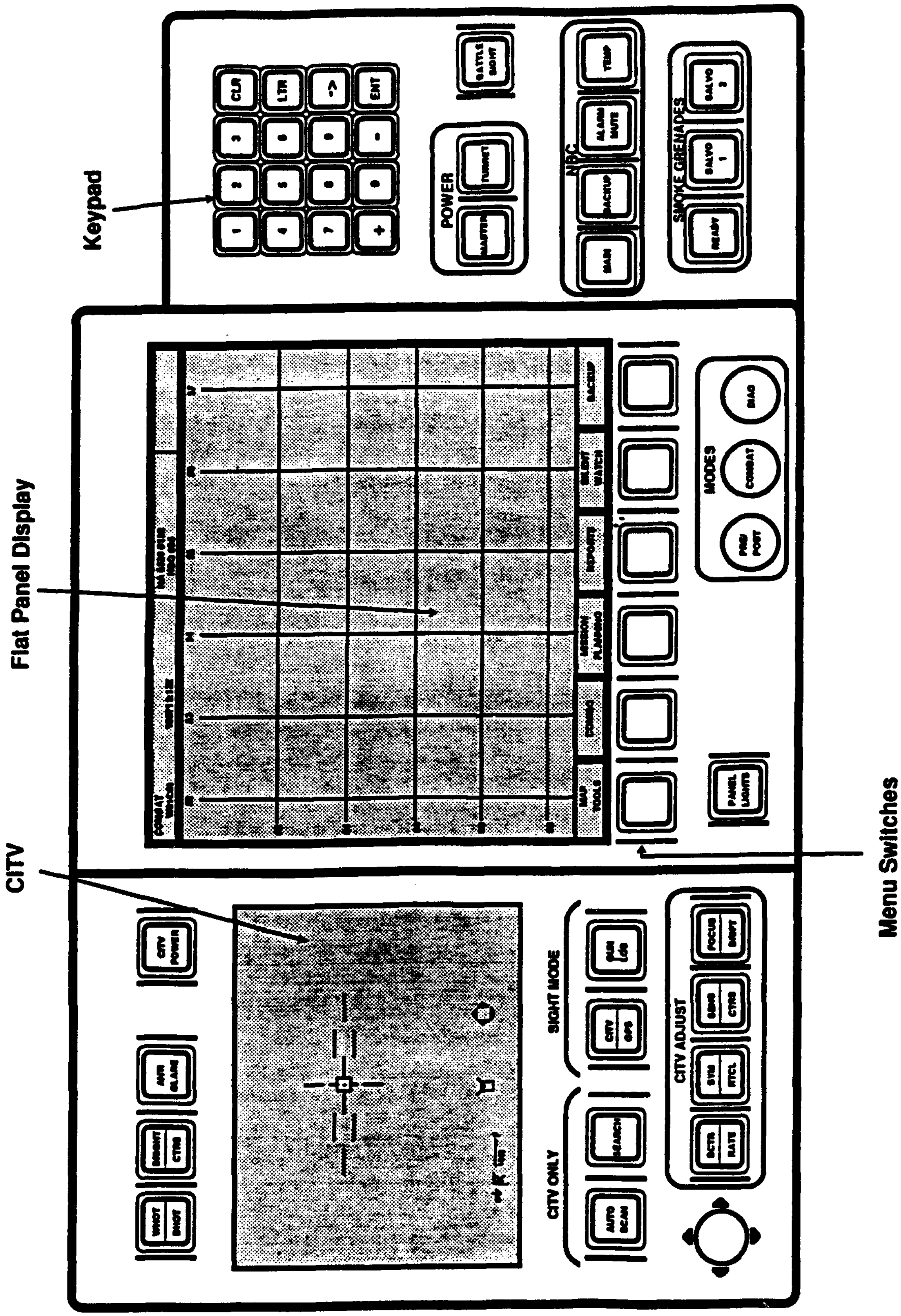

Figure 1-1. Commander's Integrated Display

The second facility is the MWTB which is located next door to the MWSTC. The primary function of the MWTB is to test research and development issues using four General Dynamic Land Systems (GDLS) M1A2 simulators, eight Army Research Institute (ARI) Combat Vehicle Command and Control (CVCC) M1 simulators, and two BFV simulators. The ADST systems used during the HI Experiment were augmented with a variety of digital command and control systems enumerated in subsection 1.5.1, following. Specific ADST systems used are enumerated in subsection 1.5.2.

1.5.1 Digital Command and Control Systems

During the HI Experiment, various digital command and control (C^2) systems were integrated with vehicle simulators to match the expected capabilities of the task force during their upcoming NTC rotation. These systems included the Intervehicular Information System (IVIS), Brigade and Below Command and Control (B2C2) systems, and Digital Message Devices (DMDs). The following paragraphs describe each system and how it was implemented in the simulation.

1.5.1.1 Intervehicular Information System (IVIS)

IVIS is the basic, vehicle-level, digital C^2 system currently integrated in the M1A2 tank and a limited number of BFVs. IVIS displays the vehicle's own current location on a monochrome grid display, along with the locations of subordinate and adjacent units, commensurate with the vehicle commander's radio configuration. IVIS also enables the vehicle to generate, receive, and relay reports to and from other IVIS-capable systems. (See Appendix E IVIS routing tables for more information. Each page shows how a specific type of digital report [e.g., CONTACT] was routed on three nets: battalion, company, and platoon command nets. The "X's" in each horizontal column indicate who received the reports when sent from their "source" [e.g., Battalion Commander] on the nets indicated.) The IVIS interface in the M1A2 Commander's Integrated Display (CID) is illustrated in Figure 1-1. During the HI Experiment, IVIS emulator software (IVIS-E) was developed to run on desktop and laptop computer systems to augment the limited number of existing IVIS-capable simulators in the MWTB.

An important limitation of IVIS-E systems was the variation in how navigational information was provided to the driver within the simulation, as compared to the actual IVIS display. The navigation component of the IVIS system provides directional data to the driver's display panel. The driver uses this information to guide the tank through a series of waypoints designated by the vehicle commander. This enables the driver to drive tactically (i.e., to use folds in the terrain to conceal the tank as much as possible from enemy observation and fires) while maintaining a designated base course without frequent verbal communications over the vehicle intercom. Specific differences between IVIS-E applications are addressed under the vehicle simulator descriptions (see section 1.5). The differences between displays occasionally caused confusion among drivers who used different simulator configurations over the course of the experiment.

Another important aspect of the simulation with respect to actual M1A2 and Bradley IVIS capabilities was the issue of radio networking and data transfer. In actual vehicles, IVIS data

Actual LCUs with B2C2 software were hard-wired into two separate LANs, one linking the combat trains command post (CTCP) with company 1SGs, and the other linking the task force's TOC with a simulated battle command vehicle (BCV).

Due to system incompatibility, there was no automated data link between the actual B2C2 systems and either the CVCC TOC workstations or the IVIS network. TOC staff and company team 1SGs had to manually transfer data from TOC workstations and IVIS displays (respectively) to the B2C2 system in order to generate reports. Since actual B2C2 systems were linked via LAN, digital traffic between terminals did not have to compete with voice radio traffic.

1.5.1.3 Digital Message Device (DMD)

DMDs are Tactical Fire Direction (TACFIRE) system terminals used by field artillery forward observers (FOs) and fire support teams (FISTs). Users may send and receive digital messages such as calls for indirect fires. DMDs can communicate using wire, AN/VRC-12 series radios or SINCGARS (Department of the Army, 1990). During the simulation, actual DMDs were used in each company FIST, the BCV, and the battalion TOC, hard-wired together in a common network. Due to system incompatibilities, there was no digital link between IVIS and the DMDs, or between the DMDs and B2C2 systems, due to system incompatibilities. FISTs with IVIS capabilities had to transfer targeting data manually from IVIS to their DMDs.

1.5.2 Basic Simulation Systems

The tactical simulation was controlled using two management, command, and control (MCC) systems, each with a SIMNET control console (SCC), and selected combat support terminals. A variety of SIMNET vehicle simulators were also integrated, as well as SAFOR, CB radios, SINCGARS simulators, a digital voice gateway, a stealth vehicle simulator, several Plan View Displays (PVDs), and the automated data collection system. This subsection describes the general characteristics of each system. The *SIMNET User's Guide* (U. S. Army Armor School, 1989) and the *Combat Engineer MCC Console Operations Documentation* (Crooks & Crooks, 1991) provide additional information regarding basic system capabilities and limitations.

The MCC systems initialized the exercise, placed and reconstituted (i.e., restored) simulators, and initialized fire support, combat engineer, and close air support (CAS) simulations. Within each MCC system, SCC terminals established the initial parameters for the exercise, and handled the placement and reconstitution of simulators. Table 1-1 shows how simulation elements were allocated between the two MCC systems. Fire support element (FSE) terminals

Table 1-1. Allocation of Simulation Elements Between Management, Command and Control Systems

MCC Location	Simulation Elements
MWTB Exercise Control Room	MWTB Vehicle Simulators BLUFOR Fire Support Element terminal BLUFOR Close Air Support terminal
Auxiliary Control Cell	MWSTC vehicle simulators OPFOR Fire Support Element terminal Combat Engineer Console

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packets and voice radio traffic must share common radio networks. The actual system grants priority to voice traffic so that voice transmissions override data packet transmissions. In the simulation, IVIS packets were transmitted over the simulation Ethernet independently of each simulator's radio. Therefore, IVIS packets never competed directly with voice traffic for radio air time in the simulation. Therefore, throughout the HI simulation, IVIS crews were able to transmit data and voice traffic simultaneously, without slowing or losing data transmissions. This factor also eliminated a potential data measure, the frequency of data packets being interrupted by voice transmissions.

The simulated IVIS network also received and transmitted data more rapidly than the actual IVIS. This was due to a faster processing rate within the IVIS simulation, as compared to the actual equipment on M1A2 tanks and IVIS Bradleys. This effect was true of all IVIS and IVIS-E platforms.

1.5.1.2 Brigade and Below Command and Control (B2C2)

B2C2 is an advanced digital C^2 system designed to run on the lightweight computer unit (LCU) for use within tactical units. The operator can create, send and receive various messages, reports and graphic overlays. The display includes an electronic map background that can be linked to the Global Positioning System (GPS) to provide automated location updates. B2C2 can communicate over a local area network (LAN) or Single Channel Ground and Airborne Radio System (SINCGARS) (U.S. Army Combined Arms Combat Development Activity, 1993). An automated data link between IVIS and B2C2 is under development for use during Task Force 1-70's NTC rotation. However, that capability is not currently available and was only supported within the simulation through the use of CVCC TOC workstations as surrogates for B2C2 (discussed in the following paragraph). Actual LCUs with B2C2 software were used within the simulation without an IVIS data link.

The CVCC research program was a multiyear developmental project investigating advanced digital and thermal technologies to enhance mounted warfighting command, control, and communications (C^3) capabilities. CVCC TOC workstations consist of a central processing unit (CPU), keyboard, mouse, two video monitors, and supporting software. As normally configured, CVCC battalion TOC workstations feature a full-color map display with four map scales (1:25,000; 1:50,000; 1:125,000; and 1:250,000), overlay drawing tools, and message handling utilities. These utilities are similar to the functional capabilities of the B2C2 system. Therefore, CVCC battalion TOC workstations were configured using a single video monitor to emulate B2C2 systems during the HI Experiment. CVCC TOC workstations were linked to the simulation Ethernet to exchange data with IVIS-capable systems within the task force. IVIS translator (ITRANS) software converted digital messages and overlays between IVIS and CVCC formats. (See Appendix F for documentation on how the ITRANS software converted digital information). TOC staff used the CVCC overlay drawing tools to create and send IVIS-compatible overlays on the battalion network, but could not receive overlays from the simulators. See Leibrecht, et al. (1993) and Meade, Lozicki, Leibrecht, Smith and Myers (in preparation) for more detailed descriptions of the CVCC TOC workstations.

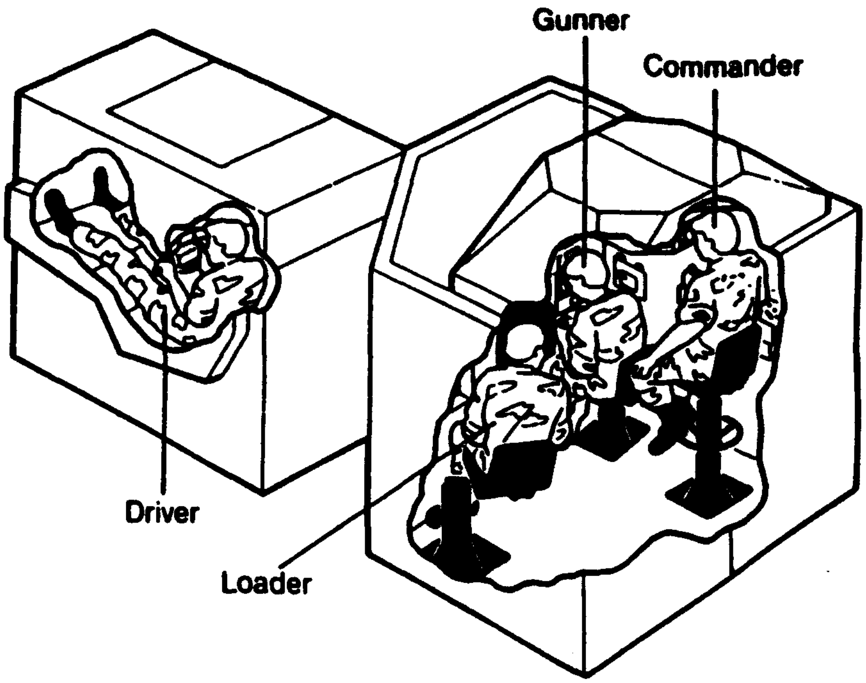

Figure 1-2. M1 Simulator

have carried tube-launched, optically tracked, wire-guided (TOW) missiles and 25 mm ammunition.

Four IVIS-equipped GDLS M1A2 simulators in the MWTB supported the HI Experiment. These simulators featured monochrome, flat-panel computer displays at all crew stations as well as other controls and indicators that replicated systems unique to the M1A2 tank. For example, the driver's integrated display (DID) in the simulator looked and functioned like the driver's display in an actual M1A2. Drivers checked vehicle status, operated equipment such as fire extinguishers, and received navigation information in the same way they could on the actual vehicle. The M1A2 simulators also included a Commander's Independent Thermal Viewer (CITV). The CITV used thermal technology that allowed the vehicle commander to scan for targets independently of the tank turret in any light or visibility condition. The actual M1A2 was the first U.S. Army tank to employ a CITV. The CITV and IVIS controls and displays are part of the CID (illustrated in Figure 1-1) on both the actual vehicle and the simulator. When M1A2 simulators were used to represent M1A1s, the IVIS and CITV were disabled. However, the driver's displays could not be disabled, presenting the driver with controls that did not correspond with those he usually operated. M1A2 simulators were equipped with CB radios for tactical communications.

In addition to the features described in the preceding paragraph, M1A2 simulators featured a Thermal Imaging System (TIS) channel in the gunner's primary sight. The TIS was a component of the basic M1 tank that was carried over to the M1A2. However, TIS was not modelled in the generic M1 simulator. The TIS used thermal imaging technology for target acquisition and engagement in low light and low visibility conditions. In the actual tank, the gunner could toggle between the daylight image and the thermal image on the gunner's primary sight unit. In the M1A2 simulator, though, the gunner could not toggle between thermal and daylight channels during operations. Instead, the selection was made using a software switch during vehicle initialization.

in the task force BCV and the auxiliary control cell allowed the implementation of friendly and enemy artillery and mortar fires. A combat engineer console (CEC) in the auxiliary control cell was used to emplace friendly and enemy minefields on the database. A CAS terminal in the BCV allowed for the implementation of air attacks in support of Blue Force (BLUFOR) operations.

M1 and M2 vehicle simulators in the MWTB and MWSTC were the basic elements in the high-resolution, interactive, tactical maneuver and engagement simulation. Each simulator contained crew compartments with vision blocks, sights, controls and indicators representing actual M1 and M2 vehicles. Vision blocks were video displays driven by a computer image generator (CIG) to provide out-the-window views of the simulated battlefield. Each simulator contained a host computer with its own copy of the terrain database and simulation outcome files. As each simulator moved and fired, the host computer broadcast vehicle status packets on the simulation Ethernet. The host computer received and processed information regarding other elements in the simulation and implemented the appropriate outcome through the screens and indicators in the simulator, thus facilitating the interactive simulation of combat operations. Tactical radio communications were accomplished using radio systems built into each simulator and base stations in command posts and exercise control cells.

1.5.2.1 M1 Simulators

Three different types of M1 simulators were used during the HI Experiment. Simulator allocations were driven by the IVIS capabilities desired within each stage of the training and by the availability of simulators at the MWSTC. Four M1A2 and eight CVCC M1 simulators in the MWTB were used primarily to represent actual M1A2s. Additional M1 simulators in the MWSTC were used to represent other manned vehicles throughout the simulation. When appropriate, IVIS emulators were placed in MWSTC M1 simulators to represent M1A2s. In other situations, MWTB simulators were used to represent M1A1s. In still other circumstances, M1 simulators at both sites were used as surrogates for other types of vehicles that do not exist within the ADST environment. For example, M1s were occasionally used to represent high-mobility, multipurpose wheeled vehicles (HMMWVs) and M113 family vehicles.

The basic M1 simulator consists of separate driver's and turret compartments. Figure 1-2 shows the layout of a typical M1 simulator. The simulator interior resembles the interior of a M1 tank, although some controls and indicators are represented using non-functioning mock-ups or decals on the simulator wall. Additional simulator-specific controls and indicators are integrated to facilitate selected functions such as ammunition handling. The *M1 SIMNET Operator's Guide* (U.S. Army Armor School, 1987) describes the capabilities and limitations of the basic simulator in greater detail. Although the simulator can accommodate a 55 round basic load, emulating the capabilities of the basic M1 with a 105 mm gun, basic loads were limited to 40 rounds during the HI Experiment to model M1A1s and M1A2s with 120 mm guns. Usually, when M1 simulators were used to represent other vehicle types (e.g., FIST-Vs), no ammunition was allocated to that simulator. The only exception was when M1 simulators were used to represent BFVs that would otherwise

1.5.2.2 M2/M3 Bradley Fighting Vehicle (BFV) Simulators

BFV simulators in both the MWTB and MWSTC were used during the HI Experiment to represent infantry fighting vehicles, improved TOW vehicles (ITVs), and other vehicles (e.g., FIST-V). BFV simulators were less frequently used as surrogate vehicles than M1 simulators due to their more limited availability. The generic BFV simulator consists of a single outer compartment that is further divided into a driver's station and a turret compartment. Controls and indicators replicate those found within the actual vehicle. Figure 1-3 depicts a generic BFV simulator. As with the tank simulator, selected switches and displays are non-operational mock-ups or decals, while simulator-specific switches and displays are added to perform selected functions (e.g., navigational aids and ammunition handling controls). Tactical communications were accomplished using CB radios. The basic load for BFV simulators was seven TOW missiles (two ready, five stowed) and 900 rounds of 25 mm ammunition (300 ready, 600 stowed). Initially, the 25 mm load was a mix of 410 rounds high explosive, incendiary (HEI) (230 ready, 180 stowed), and 490 armor-piercing, discarding sabot (APDS) (70 ready, 420 stowed). During task force level training, the unit chose to load BFVs entirely with APDS. The *SIMNET M2/M3 Crew Manual* (PM TRADE, undated) provides additional information regarding BFV simulator capabilities.

Two BFV simulators in the MWTB were used primarily to represent IVIS-capable M2s or M3s within the simulation. These simulators contained built-in computer screens (similar to CCDs in CVCC simulators), simulated LRFs, and SINCGARS simulators. The tow test button in the MWTB BFV simulators was modified for use as an LRF switch to model M2A3 capabilities and to allow the grid locations of lased objects to be entered into IVIS reports The SINC-GARS simulators were mounted on the simulator's interior wall, outside the turret compartment. This differed from the location of the radio mount within the turret compartment of the standard BFV simulator. These simulators also contained driver's navigation displays like those found in the CVCC simulators.

When MWSTC BFV simulators required IVIS capabilities, a laptop or desktop computer with IVIS emulator software was placed in

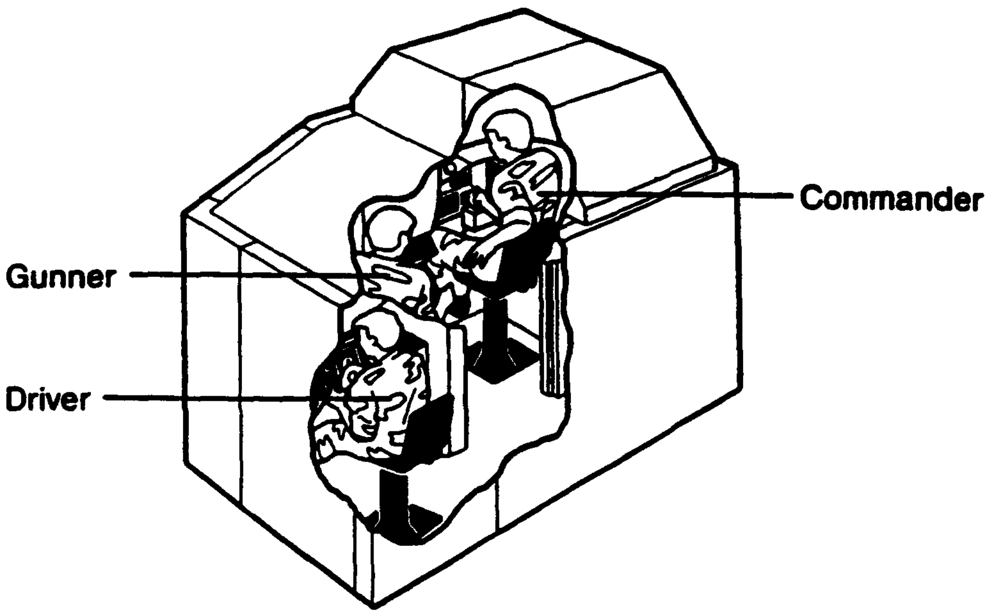

Figure 1-3. M2 Simulator

Eight M1 CVCC simulators in the MWTB also supported the HI Experiment. These were special M1 simulators developed to support the CVCC research program. The CVCC configuration included a computer monitor referred to as the command and control display (CCD), input controls, and CITV at the commander's station; a navigation display in the driver's compartment, and a CPU that ran the CVCC tactical display, navigation, and communications modules. CVCC simulators also incorporated SINCGARS radio simulators and a TIS capability. Due to the similarities between CVCC and the M1A2 system (with IVIS), CVCC simulators were the preferred platform to represent M1A2s once the actual GDLS M1A2 simulators were exhausted. IVIS emulator software was loaded in lieu of CVCC software. The CCD in the CVCC simulator served as a surrogate for the IVIS components of an M1A2 CID.

In contrast to the M1A2, the CVCC simulators' TIS could be toggled by the gunner during operations. The CITV controls and display in the CVCC simulators differed somewhat from the M1A2, but there were only two functional differences between the two CITV platforms: (1) the vehicle commander cannot shoot from the CVCC CITV like the M1A2 commander can, and (2) the CVCC CITV has its own laser range finder (LRF) capability. The driver's navigational display in CVCC simulators was entirely different from that in the M1A2. Drivers who expected the CVCC simulator display to operate the same as the M1A2 display occasionally became confused when they tried to interpret the navigational information. Two features available in both the generic M1 simulator and M1A2 simulators were omitted in the CVCC simulators: The ability to view bumper numbers on adjacent vehicles, and the ability to raise or lower the view from the commander's cupola, relative to the horizon (i.e., "look-up/look-down"). See Leibrecht, et al. (1993) for a more detailed description of CVCC simulators.

In addition to the capabilities noted in the preceding paragraphs, CVCC M1 and M1A2 simulators could be initialized with an autoloader capability. Autoloaders were used for selected vehicles during the simulation at the unit's option. The autoloader loaded the type of round selected by the gunner, if that type of ammunition was available in the vehicle's ready ammo rack. Autoloader cycle times were approximately 7.5 to 8 seconds to reload after a main gun firing, and approximately 10.5 to 11 seconds to clear the breech and reload with a different type of ammunition if the gunner changed the round selection. If the selected type of ammunition was not available in the ready rack, the ammunition compartment door cycled open and shut until the gunner changed his selection, placed the weapon on safe, or until the ammunition transfer function was initiated.

When MWSTC M1 simulators were used to represent M1A2s or other IVIS-capable vehicles, laptop or desk top computers with IVIS emulator software were placed in the simulators. The computers were plugged into the simulation network and placed on a utility cart between the loader's and commander's stations within the turret compartment. These emulators received position data and LRF inputs automatically from the simulator's host computer. Other inputs were accomplished using a mouse. These surrogate M1A2s lacked CITVs, driver's navigation displays, and TIS capabilities.

operated on the battlefield according to a combination of computer sub-routines and on-line commands. Operators controlled SAFOR units or vehicles by establishing engagement ranges, vehicle positions, unit formations, movement speed and direction, and various other parameters. The computer executed SAFOR movement, determined line-of-sight relationships, and engaged opposing vehicles according to programmed sub-routines and operator-controlled parameters. SAFOR operators interacted with manned elements according to the roles dictated by the elements they controlled. For example, a SAFOR operator controlling a tank company normally assumed the role of that company's commander. Some versions of SAFOR software have the capability to generate and transmit IVIS reports on the simulation Ethernet, but that functionality was not used during the current effort. Tactical and administrative voice communications between SAFOR operators and unit or control personnel were accomplished using CB radio base stations.

The degree of realism provided by SAFOR is limited by a number of factors. For example, SAFOR unit formations are based on textbook models, with each vehicle a uniform distance and direction from the next. Only operator input or combat losses will cause the unit to change formation. Unless the operator intervenes, a unit headed for untrafficable terrain will run into that terrain and become mired. Likewise, SAFOR units suffering significant losses will not abort an assigned task unless the last vehicle in the unit is killed or the operator inputs a new command. The operator can establish a SAFOR unit's maximum engagement range, level of proficiency, target engagement priorities, and permission to fire, but the operator cannot dictate the turret orientation of individual vehicles or control fire distribution.

1.5.2.7 Citizen's Band (CB) Radios

The generic SIMNET system uses CB radios as the primary medium for voice communications. CB radios are mounted in most simulators, and base stations are used in table-top configurations. Vehicle radio mounts include a facade that resembles AN/VRC-12 series tactical radios. Within the TOC, radios are configured to resemble either AN/VRC-12 series radios or AN/GRC-139 remote sets. The radios are linked together using radio frequency (RF) cable to preclude broadcasting beyond the facility walls.

1.5.2.8 Single Channel Ground and Airborne Radio System (SINCGARS) Simulators

SINCGARS radio simulators were introduced to the MWTB in conjunction with the CVCC program. Existing systems are mounted in CVCC M1 and MWTB M2 simulators, and in a limited number of standalone (i.e., table-top) sets. SINCGARS radio simulators translated voice traffic into digital format, and transmitted radio traffic over the simulation Ethernet. Only the vehicle-mounted SINCGARS simulators were used during the HI Experiment. Two digital voice gateways (DVGs) served as the interface between digital and CB format traffic so that CBs and SINCGARS-equipped simulators could communicate on common networks. Each gateway handled up to four radio channels, for a total of eight networks. Initially, both gateways were located in the MWTB, but during the latter stages of the experiment, one was moved to the MWSTC.

the simulator. The computer was placed on a utility cart immediately outside the turret compartment. These simulators had no LRF capabilities, so only vehicle position information was received from the host computer. Operator input was performed using a mouse in almost all cases, although one system was configured with a trackball.

1.5.2.3 Battle Command Vehicle (BCV)

A Standard Integrated Command Post System (SICPS), emulating an M577 extension, was used in the MWTB throughout task force level training to represent the task force BCV. The BCV contained three CVCC Battalion TOC workstations to simulate B2C2 systems. These systems were allocated to the S3 Air, the S2, and FSO, respectively. An LCU running actual B2C2 software, connected via the LAN to an LCU in the task force TOC, was also located in the BCV. The FSE also used a DMD in the BCV to receive and transmit messages to FISTs. A SIMNET FSE terminal in the BCV was used to execute friendly artillery missions, and a SIMNET CAS terminal was used to execute friendly air sorties. CB radio base stations located in the BCV were used for tactical voice communications. The BCV did not appear as a visible entity within the simulation.

This system, less the CAS workstation and LCU, was used as the task force command post to support company training. It was not referred to as the BCV at that time. However, for the sake of simplicity throughout the remainder of this report, any reference to the BCV will represent that work area within the MWTB.

1.5.2.4 Tactical Operations Center (TOC)

Mock-up M577 command post vehicles with extensions in the MWSTC were used during task force training to represent the task force and Brigade TOCs. Operators within the TOCs used paper-based maps, acetate overlays, and status charts to manually track unit locations and status. Tactical voice radio communications were accomplished using CB base stations. An LCU with B2C2 software, linked via the LAN, provided a data link between the BCV and the task force TOC. Communications with the Brigade TOC were limited to voice radio traffic. A DMD in the task force TOC served as a link to the TACFIRE system. This DMD was tied into the hard-wire network with other DMDs in the simulation. The TOCs were not represented on the simulation network.

1.5.2.5 Combat Trains Command Post (CTCP)

A portion of the SICPS tent, separated by partition from the BCV, housed the CTCP within the MWTB. Operators used CB radio base stations for tactical voice communications. An LCU with B2C2 software was networked via the LAN to unit 1SGs for digital administrative and logistic (admin/log) traffic. The CTCP did not appear on the simulation database.

1.5.2.6 Semiautomated Forces (SAFOR)

SAFOR elements were used to represent all OPFOR maneuver and air elements and to fill out unmanned combat elements of the task force. SAFOR are computer-generated forces that

CVCC simulators had to undergo special processing to ensure compatibility with the host simulator. Different versions of the database were resident in different types of systems, although all were basically compatible.

1.6 REPORT ORGANIZATION

The remainder of this report is organized into four sections. Section 2.0 describes the research issues, the general approach, and the exercise conditions involved in the effort. Section 3.0 summarizes the methods used, including the unit configurations, support personnel, training procedures, exercise scenarios, and automated data collection procedures. Section 4.0 discusses the lessons learned which are beneficial to future research, addressing issues of simulation systems, methodology, and data collection. Finally, section 5.0 offers recommendations for future research issues and for enhancing ADST methodology and procedures.

1.5.2.9 Stealth Vehicle Simulator

The stealth vehicle simulator at the MWTB was used by exercise observers to monitor tactical events. The stealth simulator consisted of a plan view display (PVD) and spaceball, a host computer, a CIG, and a large-screen video monitor. The host computer received data from the simulation ethernet, and the CIG generated an "out the window" view on the large screen monitor. The PVD and space ball were used to manipulate the location and viewing angle of the stealth simulator. The stealth simulator could observe combat vehicles, minefields, and aircraft but was transparent to other simulators in the exercise.

1.5.2.10 Plan View Display (PVD)

In addition to the PVD at the stealth, support personnel used PVDs to monitor operations, flag selected events for data collection, and support After Action Reviews (AARs). The PVD is a full-color, two-dimensional map screen that can show all tactical elements involved in a given exercise. BLUFOR and OPFOR vehicles are shown in blue and red, respectively. Various utilities provide the PVD operator with a wide variety of useful functions (e.g., checking intervisibility between vehicles, measuring distances, identifying individual vehicles, and locating specific vehicles of interest). The PVD also depicts minefields, engagement events, and the impact of indirect fires and aerial bombs. Two PVDs were located in the exercise control room (ECR), and one in the auxiliary control cell.

1.5.2.11 Automated Data Recording System

A Silicon Graphics, Inc. (SGI) Indigo computer captured all data packets transmitted by simulation elements participating in the exercises and recorded those packets to disk. Examples of simulation packets captured included vehicle appearance packets, fire packets, and impact packets. A clock unit provided time stamps as part of the data stream. Following the tactical exercises, SGI files were used to extract automated data in support of the evaluation plan. The DataLogger did not record voice transmissions. Due to disk limitations with the DataLogger, the SGI logger was used on one occasion for AAR playback because the DataLogger disk was too small to capture the data. AAR playbacks allowed simulation participants to view the exercise from a projected PVD or stealth view, and to review what occurred in detail.

1.5.2.12 Voice Recording System

Video Cassette Recorders (VCRs) were used to record voice radio communications, one radio network per VCR. Time signals from the automated data recording systems's clock unit were recorded to ensure the ability to synchronize simulation events with voice radio traffic. The audio feed to the VCRs was obtained via RF cable from a CB base station. All networks supported by the DVG were recorded using a total of eight VCRs to capture all command net traffic at company team level and above.

1.5.2.13 Terrain Database

Each vehicle and stealth simulator, PVD, SAFOR system, and CVCC TOC workstation participating in the simulation used individual terrain databases that represented the National Training Center. For the most part, the database files used by each type system (e.g., vehicle simulators) were identical. A notable exception was that the terrain database used on

gade to which TF 1-70 was to be attached during its NTC rotation (3rd Brigade, 24th Infantry Division [Mechanized]). Electronic files and related materials required for SIMNET scenario implementation were developed by contract personnel. All exercises were executed in force-on-force mode, with the OPFOR consisting entirely of SAFOR elements. The OPFOR represented a former Soviet client state, employing Soviet weapons and tactics as outlined in FM 100-2-1 (Department of the Army, 1984).

At each level of training, exercise controllers were provided by the next higher level of the chain of command. For example, brigade headquarters personnel served as controllers during all task force training exercises. Controllers conducted mission briefings, monitored scenario planning and execution, represented higher headquarters positions during execution, and supported AARs.

A contractor-staffed exercise support team included experienced specialists required to operate the simulation equipment. This team initiated and maintained the simulation elements for each scenario, operated the SAFOR control stations, represented adjacent and subordinate elements, executed fire support and combat engineer functions, supported scenario playbacks for AARs, supported automated data recording, and documented equipment problems. In addition, research scientists supported the planning of automated data collection as well as the follow-on reduction of automated data.

A systematic data collection plan (see Appendix A) was developed to document the task force's performance during scenario execution. The types of data collected included: automated performance data, subject matter expert (SME) observations, questionnaire responses by key unit personnel, and post-scenario comments made by unit personnel during AARs.

2.3 EXERCISE CONDITIONS

The case study nature of the HI Experiment and the training requirements of TF 1-70 set the stage for the experimental design. The driving precept called for the task force to perform its combat tasks using available digital technology and the operating procedures it expected to use at the NTC. Because of limitations on the experimental scope, no control group or baseline condition was planned for this effort. However, follow-on efforts may provide opportunities to collect descriptive data regarding the performance of conventional (i.e., baseline) units. Two variables of interest were embedded in the overall approach: size of the unit in training (platoon, company team, and task force) and type of mission (i.e., defense, attack, and movement to contact). At the task force level, the unit completed one run through each scenario, with the potential to compare performance across the unit's four company teams limited by differences in specific missions, engagement opportunities, and other similar factors.

By and large, task force exercises provided the principal data collection opportunities. The sequence of missions is recounted in Chapter 3 (see section 3.4.3). The scenarios were designed for execution as a continuous series of operations, typical of a NTC rotation. Generally, one mission was executed each day, with thorough AARs concluding each day. The task force commander modified the unit's task organization to meet specific requirements of each mission.

Tactical communications were accomplished using CB radios and SINCGARS simulators,

CHAPTER 2
DESIGN

2.1 ISSUES

The research issues underlying the HI Experiment are addressed in the evaluation plan associated with the experiment (Appendix A). The methodological issues related to contractor support objectives were as follows:

- What difficulties were encountered in planning and preparing for the HI Experiment?
- What shortcomings in basic simulation capabilities were encountered?
- How could the procedures for testing the hardware and software be improved?
- What implementation and execution problems occurred?
- How could the data collection and reduction procedures be enhanced?

These contractor support issues provide the framework for this lessons learned report. Information pertaining to the research issues, including performance data, is presented in the MWBL report.

2.2 GENERAL APPROACH

The HI Experiment was designed as a case study to assess the combat performance impact of digital technology in the context of TF 1-70 training for its upcoming NTC rotation. Using DIS facilities at the MWTB and MWSTC, unit configurations of elements of TF 1-70 were replicated by combining vehicle simulators, digital C^2 device simulators, and SAFOR. Vehicle simulators included M1A2 and M1 main battle tank simulators, M2/M3 BFV simulators, M1 simulators serving as HMMWV and M113 vehicles, and M2/M3 simulators serving as M2A3s and ITVs. Three digital C^2 devices were simulated: the IVIS, the B2C2 system, and the DMD. BCV, TOC, and CTCP capabilities were modeled to include B2C2 workstations. Tactical radio capabilities were modeled at brigade level and below.

Training exercises were organized at the platoon, company, and task force levels by task force and brigade personnel. Set in the context of company team exercises, platoon level training was conducted by one of the TF 1-70 company teams. All four of the task force's company teams conducted three days of training each, implementing their habitual task organizations with all crews in simulators. At the task force level, TF 1-70 conducted seven days of training with variable task organizations implemented by combining manned simulators and SAFOR vehicles. As a general rule, task force training was accomplished with crews at the platoon sergeant level and above operating in simulators. A more detailed account of the unit's organization during each exercise is provided in Chapter 3, section 3.1.

Unit training at all levels involved simulated combat scenarios designed to prepare the task force for its NTC rotation. Accordingly, all training exercises were set on the NTC terrain database. At all levels, the set of training scenarios included three types of missions: defense, attack, and movement to contact. Force ratios varied by scenario according to the units' training objectives. The command and control environment was modeled after current battlefield doctrine. Platoon and company scenarios were developed by task force personnel, while task force scenarios were developed by the bri-

with operational networks approximating those normally used by the task force. Degradation of radio communications resulting from distance and terrain masking were not modeled. All digital messages were transmitted via a communications Ethernet instead of through the radio unit, omitting the interrupted digital transmissions and garbling typically encountered in the field.

The simulated terrain database was a fairly realistic representation of actual NTC terrain, including hilly regions with narrow passes. Slow-go and no-go regions of the database corresponded to specific terrain conditions characterizing the NTC region, such as soft sand.

Only daytime operations with clear, sunny skies, moderate temperatures, and dry ground conditions were modeled in the simulation experiment. Due to limitations of the basic simulation technology, all operations were conducted in closed-hatch mode. Low light conditions, such as dusk and night, were not modeled, nor were battlefield obscurants such as smoke. Minefields were visible through vision blocks by virtue of markers appearing on the terrain. Contaminated areas were modeled notionally.

By and large, tactical logistics were modeled notionally. When a vehicle sustained damages from any cause, it was normally not "repaired" or reconstituted during the remainder of the exercise. Fuel and ammunition were not resupplied during the course of a scenario. Generally, when a vehicle was "killed," its crew was out of the play for the duration of the exercise. At the start of a new scenario, the support staff reconstituted the entire unit at full strength, with full fuel and ammunition loads for each vehicle. During the last day of task force training, a logistics exercise was conducted to challenge the unit's logistics communications, coordination, and planning capabilities.

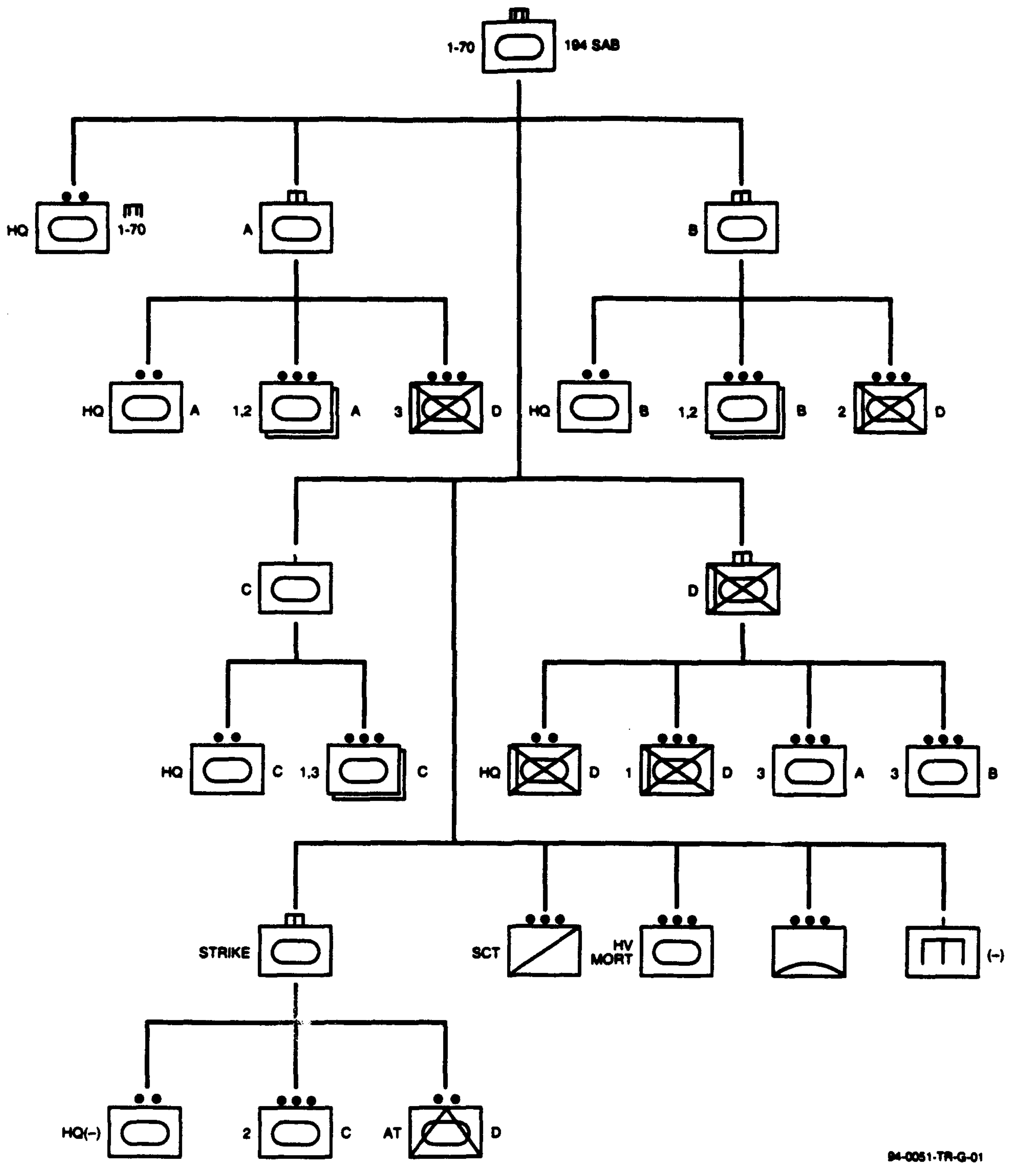

Figure 3-1. Habitual Task Organization of Task Force 1-70, 194th SAB

CHAPTER 3
SUMMARY OF METHODS

3.1 DESCRIPTION OF UNITS

This section describes the units involved in the HI Experiment, and explains how manned, semiautomated, and combat support simulator systems were allocated to represent elements of the task force.

3.1.1 Task Force (TF) 1-70

Task Force 1-70 is permanently task-organized with three tank companies (A, B, and C Companies), and a mechanized infantry company (D Company, 2-15 Infantry, Mechanized). Organic units also include a scout platoon, heavy mortar platoon, and combat service support elements. In addition to the permanent task organization, the unit has a habitual task organization as depicted in Figure 3-1.

Besides the task organization, the allocation of digital C^2 systems was an important consideration in the allocation of simulator systems to support the HI Experiment. Figure 3-2 illustrates how those systems will be allocated throughout the task force during the actual NTC rotation. The different types of simulators described earlier (see section 1.5) were allocated in similar fashion during the current effort to model the capabilities the task force will have available during the rotation.

During the company team training, the habitual task organizations of the respective company teams were maintained. During the task force exercises, the task organization was modified by scenario, according to the mission, enemy, terrain, time, and troops (METT-T) available.

Throughout the training, M1 and BFV simulators were frequently used to represent other vehicle types that do not exist in the MWTB and MWSTC. For example, 1SGs and FISTs typically used M1 simulators in lieu of HUMMWVs and FIST-Vs, respectively. When surrogate vehicles were used, weapons functionalities were matched as much as possible. Bradley simulators were used to represent ITVs during Company C/Team Strike training exercises. Due to a shortage of BFV simulators, M1 simulators were used as surrogates for BFV simulators within the mechanized infantry platoon during Team D's training. All opposing force maneuver units were represented using SAFOR.

BLUFOR and OPFOR artillery and mortars were generated through the MCC, using separate FSE workstations for each force. The BLUFOR FSE workstation was located in the TF TOC. The OPFOR FSE was collocated with the OPFOR workstations. Engineer play (emplacing minefields) was exercised using a CEC located adjacent to the OPFOR FSE terminal.

3.1.2 Platoon Training

Platoon training was conducted within the context of company team exercises, directed by the company commander. TF 1-70 elected to have only one company team, Team B, participate in the training at this level. Four M1A2 simulators were allocated to the platoon leaders and team commander. The remainder of the BLUFOR company team and adjacent BLUFOR

company teams consisted of SAFOR. In the case of the mechanized infantry platoon, a SAFOR M2 platoon was created and tethered to the platoon leader in an M1A2 simulator. The support staff used a standalone IVIS terminal to monitor the company IVIS network.

3.1.3 Company Team Training

Each company team was fully manned during its respective three-day training period. Simulators were allocated for each company commander, executive officer, FIST, first sergeant, aid team, and all combat vehicles within assigned or attached platoons. The tank and mechanized platoons in adjacent company teams of the task force were represented using SAFOR, as outlined in Table 3-1. One manned simulator was made available for the battalion commander or another member of the command group, to be used for mounted observation of the team in training.

3.1.4 Task Force Training

Simulator availability and the task force's training objectives dictated periodic modifications to the task force configuration during the exercise. Simulator availability at the MWSTC

Table 3-1. Division of Forces Among BLUFOR Semiautomated Force Workstations During Company Team Training

Unit(s) in Training	Mission	Units Controlled — SAFOR WS 1	Units Controlled — SAFOR WS 2
Team A	Defense	Teams B & Strike (5 plts)	Company C & Team D (5 plts)
	Attack	Teams B & Strike (5 plts)	Company C & Team D (5 plts)
	Movement to Contact	Teams D & Strike (5 plts)	Team B & Company C (5 plts)
Team B	Defense	Teams A & Strike (5 plts)	Company C & Team D (5 plts)
	Attack	Company C & Team Strike (4 plts)	Teams A & D (6 plts)
	Movement to Contract	Teams A & Strike (5 plts)	Company C & Team D (5 plts)
Co C & Team Strike	Defense	Teams A & B (6 plts)	Team D (3 plts)
	Attack	Team B (3 plts)	Teams A & D (6 plts)
	Movement to Contact	Teams A & D (6 plts)	Team B (3 plts)
Team D	Defense	Teams B & Strike (5 plts)	Team A & Company C (5 plts)
	Attack	Teams B & Strike, Company C (7 plts)	Team A (3 plts)
	Movement to Contact	Teams A & Strike (5 plts)	Team B & Company C (5 plts)

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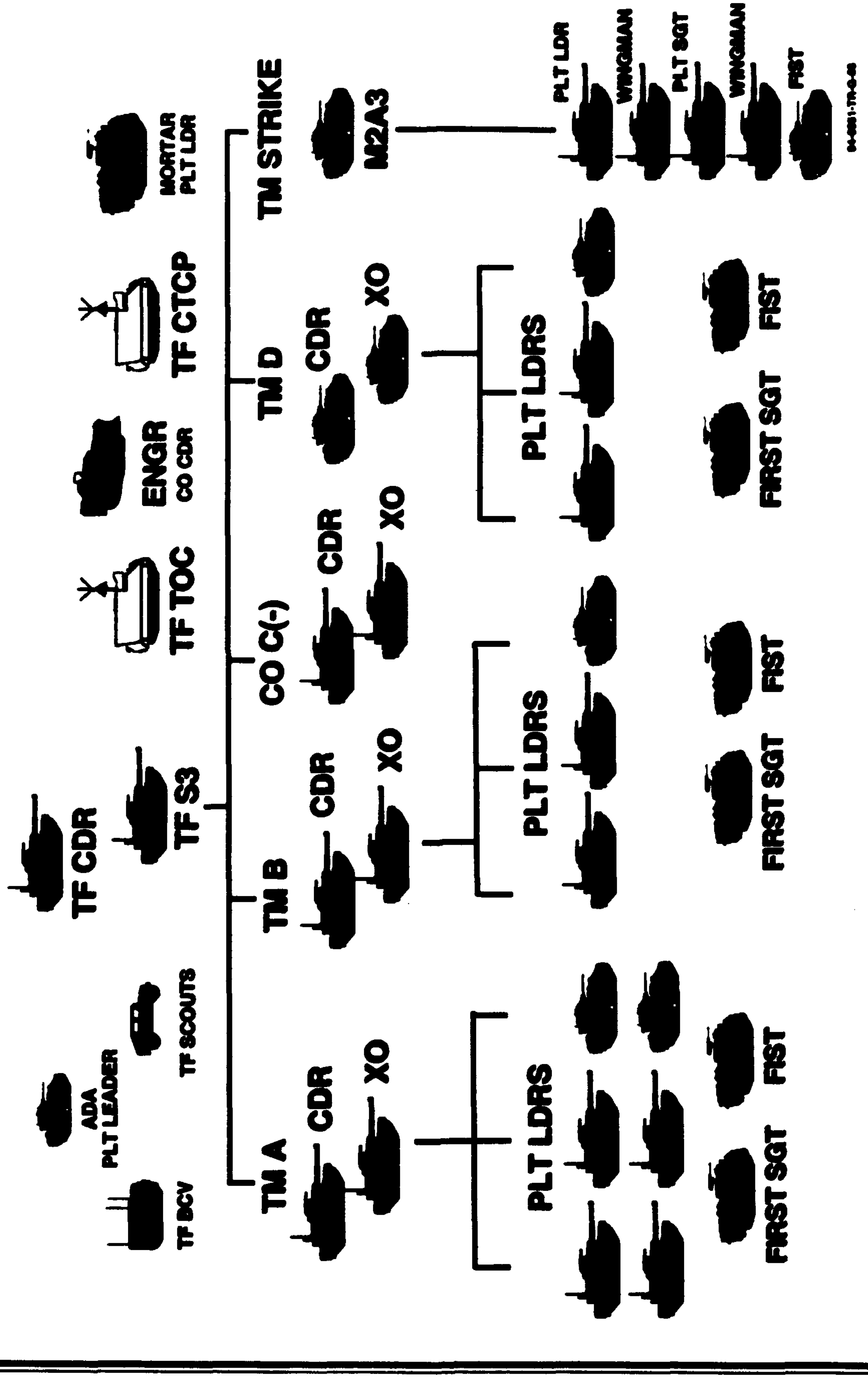

Figure 3-2. Allocation of IVIS Systems in TF 1-70 for NTC Rotation 94-07

Table 3-3. Additional Vehicle Simulator Manning Requirements, Task Force Training, December 17-19

Duty Position[a]	Dec. 17	Dec. 18	Dec. 19
Scout Squads (4 each)	M1	M1	--
Aid Teams (8 each)	--	--	M1
Tm A 1SG	--	--	M1A2
Wing Tank/1st Plt (A12)	M1	M1	--
Wing Tank/1st Plt (A13)	M1	--	--
Wing Tank/2nd Plt (A22)	M1	M1	--
Wing BFVs/3rd Plt (2 each: D32, D33)	M2	--	--
Tm B 1SG	--	--	M1A2
Wing Tank/1st Plt (B12)	M1	M1	--
Wing Tank/1st Plt (B13)	M1	--	--
Wing Tank/2nd Plt (B22)	M1	M1	--
Wing Tank/2nd Plt (B23)	M1	--	--
Wing BFV/3rd Plt (D22)	M2	--	--
Co C 1SG	--	--	M1A2
Wing Tank/1st Plt (C12)	M1	M1	--
Wing Tank/3rd Plt (C32)	M1	M1	--
Wing Tank/3rd Plt (C33)	M1	--	--
Tm D 1SG	--	--	M1A2
Wing BFVs/1st Plt (2 each: D12, D13)	M2	--	--
Wing Tank/2nd Plt (A32)	M1	M1	--
Wing Tank/2nd Plt (A33)	M1	--	--
Wing Tank/3rd Plt (B32)	M1	M1	--

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Notes.
Except for M1A2s, all vehicles were non-IVIS simulators in MWSTC. The alignment of platoons among company teams shown above is based on the unit's habitual task organization. The actual task organization was modified for December 17-18.
[a]Alpha numerics in parentheses (e.g., A13) represent vehicle bumper numbers.

ated using SAFOR. On December 18, one SAFOR wing tank was required for each tank platoon in the task force except the 2nd platoon of C Company, which was entirely composed of SAFOR vehicles. Two SAFOR wing vehicles were required for each mechanized infantry platoon. As usual, the ITV section was represented using SAFOR. Also, a SAFOR air defense platoon[1] was added to the simulation to represent Stinger teams. On December 19, the TF reverted to the SAFOR configuration used on December 13-16.

3.2 SUPPORT PERSONNEL

Personnel supporting the HI Experiment can be categorized into several groups, all reporting to the Delivery Order (DO) Manager, over the course of the project. Software engineers developed the IVIS emulator and translator programs prior to the simulation, supported functional testing, and provided technical support throughout the exercise. A systems analyst provided technical and operational support related to simulator and C^2 systems integration issues, both prior to and during the simulation, and designed and conducted functional testing. MWTB site technicians installed and maintained simulator and C^2 systems throughout the project. MWSTC site support personnel provided technical support on MWSTC M1 and BFV simulators. A training developer and selected members of the scenario support staff developed and conducted simula-

[1]Friendly SAFOR unit options include a tracked, missile-firing air defense platform that can be configured to functionally represent a variety of currently fielded and planned surface-to-air systems. In this case, the systems were limited to line-of-sight acquisition and a 5000 meter range in order to model Stinger teams.

differed throughout the task force training period, due to competing simulator requirements. The task force's training objectives changed slightly from day to day, as different forms of combat operations (e.g., offense and defense) were emphasized. Likewise, Admin/Log operations received greater emphasis during the logistics exercise (LOGEX) on the last day of task force training. The task force itself determined the most appropriate mix of manned and SAFOR elements, given their daily training objectives and simulator availability.

The priority for manned simulator allocations was to C^2 vehicles. Table 3-2 shows the common positions manned throughout task force training. Variations to the manning scheme are described in following paragraphs.

During the first four days of task force training, December 13-16, wing tanks for all line platoons except 2nd platoon of Team Strike were represented using SAFOR. First sergeants operated from standalone B2C2 LCUs in the MWTB. The ITV section was represented using SAFOR BFVs throughout task force level training. Combat support was controlled in the same manner as in company team training, with the addition of a CAS terminal in the TF TOC. Table 3-3 shows additional vehicles that were manned on December 17-19.

Table 3-4 shows the allocation of friendly SAFOR among the two dedicated workstations. Due to the manning level on December 17, only wing vehicles and the ITV section were gener-

Table 3-2. Task Force Common Manned Simulator Requirements

Duty Position	Simulator Type/Remarks
Battalion Commander	CVCC M1
Battalion S-3	CVCC M1
Scout Platoon Leader	MWSTC M2 w/IVIS-E[1]
Scout Platoon Sergeant	MWSTC M1 w/IVIS-E[1]
Mortar Platoon Leader	MWSTC M1 w/IVIS-E[1]
ADA Platoon Leader	MWSTC M2 w/IVIS-E
Engineer Company Commander	MWSTC M1 w/IVIS-E[1]
Engineer Platoon Leader	MWSTC M1 w/IVIS-E[1]
Engineer Platoon Sergeant	MWSTC M1 w/IVIS-E[1]
Tm A Commander	CVCC M1
Tm A Executive Officer	CVCC M1
Tm A FIST	MWSTC M1 w/IVIS-E & DMD[1]
1st Plt Ldr/Tm A (1/A/1-70)	MWSTC M1 w/IVIS-E
1st Plt Sgt/Tm A	MWSTC M1 w/IVIS-E
2nd Plt Ldr/Tm A (2/A/1-70)	MWSTC M1 w/IVIS-E
2nd Plt Sgt/Tm A	MWSTC M1 w/IVIS-E
3rd (Mech) Plt Ldr/Tm A (3/D/2-15)	MWSTC M2 w/IVIS-E
3rd Plt Sgt/Tm A	MWSTC M2 w/IVIS-E
Tm B Commander	CVCC M1
Tm B Executive Officer	CVCC M1
Tm B FIST	MWSTC M1 w/IVIS-E & DMD[1]
1st Plt Ldr/Tm B (1/B/1-70)	MWSTC M1 w/IVIS-E
1st Plt Sgt/Tm B	MWSTC M1
2nd Plt Ldr/Tm B (2/B/1-70)	MWSTC M1 w/IVIS-E
2nd Plt Sgt/Tm B	MWSTC M1
3rd (Mech) Plt Ldr/Tm B (2/D/2-15)	MWSTC M2 w/IVIS-E
3rd Plt Sgt/Tm B	MWSTC M2
Co C Commander	CVCC M1
Co C Executive Officer	CVCC M1
Co C FIST	MWSTC M1 w/DMD[1]
1st Plt Ldr/Co C (1/C/1-70)	MWSTC M1
1st Plt Sgt/Co C	MWSTC M1
3rd Plt Ldr/Co C (3/C/1-70)	MWSTC M1
3rd Plt Sgt/Co C	MWSTC M1
Tm D Commander	MWTB M2 w/IVIS-E
Tm D Executive Officer	MWSTC M2 w/IVIS-E
Tm D FIST	MWSTC M2 w/IVIS-E & DMD[1]
1st Plt Ldr/Tm D (1/D/2-15)	MWSTC M2 w/IVIS-E
1st Plt Sgt/Tm D	MWSTC M2
2nd (Tank) Plt Ldr/Tm D (3/A/1-70)	MWSTC M1 w/IVIS-E
2nd Plt Sgt/Tm D	MWSTC M1
3rd (Tank) Plt Ldr/Tm D (3/B/1-70)	MWSTC M1 w/IVIS-E
3rd Plt Sgt/Tm D	MWSTC M1
Tm Strike Commander	MWTB M2 w/IVIS-E
Tm Strike FIST	MWSTC M1 w/IVIS-E & DMD[1]
Tank Plt Ldr/Tm Strike (2/C/1-70)	M1A2[2]
Plt Sgt/Tm Strike	M1A2[2]
Wing Tank/Tm Strike (Bumper # C22)	M1A2[2]
Wing Tank/Tm Strike (Bumper # C23)	M1A2[2]

94-0081-TR-W-03

[1] Surrogate vehicle

[2] During the last day of training, the tank platoon in Team Strike operated in MWSTC M1s with IVIS-E.

Table 3-5. Support Staff Positions Required During Company Team and Task Force Level Training

Position	Remarks
Delivery Order manager	Also served as systems engineer
MCC/SCC operator	Central POC for network problems and support staff coordination; supported AAR play backs
SAFOR operators	2 BLUFOR, 2 OPFOR operators
BLUFOR FSE operator	Assisted BCV staff members in the operation of CVCC TOC workstations
CEC/OPFOR FSE operator	Operated the SCC controlling MWSTC simulators during scenario execution
Systems analyst	Monitored simulation network status; analyzed and documented network problems
Floor monitors	One at MWTB and one at MWSTC; documented equipment problems
PVD operator/event flagger	Primarily supported data collection during task force training
Software engineers	Provided substantial on-site support during exercises
MWTB site technicians	5 dedicated technicians operated throughout HI Experiment
MWSTC site support personnel	Present during all stages of MWSTC operations

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lers and participants, and contractor support personnel, and exercised overall responsibility for the preparation and execution of the simulation. He allocated, placed, and reconstituted all manned simulators and MCC-generated forces, supervised all SAFOR operations from a technical standpoint, operated the DataLogger during exercises and after action reviews, and coordinated all aspects of technical support during and between simulations. The MCC/SCC operator was assisted, as required, by BLUFOR and OPFOR controllers, floor monitors, and the CEC/OPFOR FSE operator.

SAFOR operators controlled all SAFOR elements in the simulation. Friendly SAFOR controllers reported to the BLUFOR tactical leaders and commanders, as required, throughout each scenario. The units they controlled varied by scenario, as shown in Tables 3-1 and 3-4. During task force training, the BLUFOR controllers were generally assisted by radio telephone operators (RTOs) from task force units. OPFOR operators controlled all enemy units. OPFOR elements were divided between the two OPFOR workstations and operators in order to maintain an equitable division of labor and avoid system overload, if possible. During company team training, OPFOR controllers reported to the task force S-2, who acted as the OPFOR commander. During task force training, the 194th Bde S-2 or his representative acted as the OPFOR commander.

The BLUFOR FSE operator executed indirect fires in support of friendly forces, and moved the task force mortar platoon, as directed by the task force Fire Support Officer (FSO).

Table 3-4. Division of Forces Among BLUFOR Semiautomated Force Workstations During Task Force Training

Day(s)	SAFOR WS 1	SAFOR WS 2
Dec. 13-16, 19	Tm A: All wing vehicles Tm B: All wing vehicles Tm Strike: ITV section Total: 14 vehicles	Co C: All wing vehicles Tm D: All wing vehicles Total: 10 vehicles
Dec. 17	Four wing vehicles (A23, (B33, C13, D23), ITV section Total: 6 vehicles	None
Dec. 18	Tm A: Four wing vehicles (A13, A23, D32, D33) Tm B: Four wing vehicles (B13, B23, D22, D23) Tm Strike: ITV section Total: 10 vehicles	Co C: Two wing vehicles (C13, C33) Tm D: Four wing vehicles (D12, D13, A33, B33) AIR DEFENSE platoon Total: 10 vehicles.

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tor and C^2 equipment training for unit personnel. Research scientists assisted USAARMC personnel in the selection and definition of performance measures, the construction of data collection instruments, and in data processing activities.

Scenario support personnel prepared and supported the actual tactical simulations. The level of effort necessary to support tactical training differed significantly between the platoon level training effort in October, and the company team and task force level training periods in December. The following subsections enumerate support staff roles and responsibilities.

3.2.1 Platoon Training

Support personnel for platoon level training included an MCC/SCC operator and two SAFOR operators. The MCC/SCC operator allocated, placed, and reconstituted all manned simulators and MCC-generated forces (i.e., engineers and fire support elements), supervised all SAFOR operations, performed basic troubleshooting activities, and coordinated with site technicians when problems occurred. One SAFOR operator supported the BLUFOR, and one operated the OPFOR. Indirect fires were simulated directly through the SAFOR terminals using the "bomb button." Operators also used the CEC to emplace minefields in support of the simulation. The responsibility for CEC operation was shared among all three support staff members.

3.2.2 Company Team and Task Force Training

The support staff for the company team and task force level training phase was much larger than that required for platoon level training, due to the significantly expanded operational scope during the December time frame. Table 3-5 enumerates support staff roles. The remainder of this section explains the responsibilities associated with each duty position.

The DO manager bore overall responsibility for the coordination and conduct of contractor support efforts during the HI Experiment. He worked closely with software engineers, site technicians, the project officer, and the MCC/SCC operator to identify and resolve equipment-related problems.

The MCC/SCC operator served as the primary point of contact between military control-

capabilities. As ongoing software development schedules permitted, support staff members practiced IVIS tasks on the emulators. Staff members also used functional test checklists as guidelines to check out the emulators, to train themselves, and to refine the checklists. The day prior to the actual functional test, staff members performed systematic checks on most of the simulator and test equipment features using revised checklists, documented any bugs for further investigation, and noted any equipment-related questions that still required clarification.

3.3.2 Command Post Staff Training

Contract personnel trained selected TOC staff members from TF 1-70 to operate the CVCC battalion TOC workstations. The training emphasized those CVCC TOC workstation features that closely paralleled B2C2 functions.

The CVCC TOC workstations were used during the HI Experiment because of the functional similarities between the CVCC and B2C2 software. In order to capitalize on those similarities, prior training on B2C2 was established as a desirable prerequisite for HI Experiment TOC workstation operators. Operators were also to be qualified in their specific duty positions prior to the CVCC TOC workstation training. The training schedule permitted hands-on training and practice on the basic skills for up to eight hours. This represented a reduction from the two days originally projected for TOC training.

Training on the S2, S3, FSO, and S1/S4 TOC workstations took place from 0800 - 1700 on November 9, 1993. The training program consisted of (1) an introduction to the trainers and the workstations and (2) hands-on training on the TOC workstation message and map modules. Out of the six trainees, three had not worked with the B2C2. Despite this, most of the participants were fairly computer literate and had acquired the most basic TOC workstation usage skills by the end of the day. The trainees requested an opportunity to use their new skills to support a tactical scenario prior to the beginning of the HI Experiment, but congested site and soldier schedules prohibited this from taking place.

3.3.3 CVCC M1 Familiarization Training

The objective of this training was to familiarize vehicle commanders with unique aspects of the CVCC M1 simulator configuration. The training emphasized those basic simulator features which differed from standard MWSTC M1 simulators (e.g., autoloader, SINCGARS radio, and the lack of a bumper number viewing capability). Trainers also pointed out the differences between the M1A2 CITV and the CITV in the CVCC M1 simulators. Vehicle commander training for personnel from Team A took place Wednesday, November 3 from 0800 - 1200. Members of other units throughout the task force were scheduled for this training over the days that followed. However, Team A participants proved to be reasonably well skilled on M1A2 CITV operation and with simulators in general, and quickly achieved their training objectives on the CVCC simulators. Furthermore, their level of expertise was said to be typical of combat vehicle crew members throughout the battalion. Based on this information, the task force and support staff decided to cancel training for the other company teams.

In retrospect, it became clear that the Team A vehicle commanders possessed above-aver-

The CEC/OPFOR FSE operator emplaced minefields in support of the defensive force (BLUFOR or OPFOR, depending on the scenario), and executed indirect fires in support of the OPFOR.

Floor monitors assisted simulator crews in basic trouble shooting tasks, and coordinated site support in the event of equipment failures. Floor monitors also maintained breakdown logs in order to document system problems. One floor monitor operated within the MWTB, the other worked in the MWSTC.

The PVD operator/event flagger observed task force operations from the ECR, and entered electronic flags into the data stream to identify selected tactical events. This operator also maintained a log of flags and the events they represented.

Software engineers were present, on site, in varied numbers throughout the December 1-19 time frame. During simulation set-up and execution, engineers assisted in trouble shooting and corrective actions related to IVIS and IVIS-E systems, and network interface issues. Engineers were also involved in the installation of IVIS-Es in MWSTC simulators, and in the initialization of IVIS machines and CVCC battalion TOC workstations to support the simulation. Engineers also continued to refine IVIS-E software during the first two weeks of the exercise, in order to resolve various problem areas.

Site support personnel at both the MWTB and MWSTC conducted routine periodic checks and services, and repaired malfunctions on simulators supporting the HI Experiment. The site support staff at the MWTB was dedicated entirely to HI support throughout the exercise. This staff operated in shifts in order to prepare MWTB equipment for the simulation, react to system malfunctions during the exercise, and conduct after-operations maintenance. The site support staff at the MWSTC divided their effort between the HI Experiment and other training exercises, on an as-needed basis. Although the basic functions performed by site support personnel in both locations were the same, trouble shooting responsibilities and general maintenance procedures differed enough between facilities to influence the manner by which problems were handled.

3.3 TRAINING PROCEDURES

3.3.1 Support Staff Training

Support staff training was undertaken to ensure that contractor personnel were familiar with IVIS and IVIS-E capabilities. Four members of the support staff, including the MCC/SCC operator and three of the four SAFOR operators, were knowledgeable on IVIS as the result of prior IVIS-related research. Other members of the support staff were familiar with other digital C^2 systems, including the CVCC TOC workstations and CCD. This level of familiarity simplified and accelerated cross training on the IVIS and IVIS emulators.

The MCC/SCC operator conducted familiarization training for the support staff on the capabilities of the GDLS IVIS prior to IVIS emulator delivery. This training included initialization procedures, creating routes, posting overlays, and sending reports. This initial trainup took about three hours. Support staff members also received a training outline on the GDLS IVIS to study and to use as a self-paced training guide, as time permitted.

Once the IVIS-Es were delivered, the support staff watched demonstrations of system

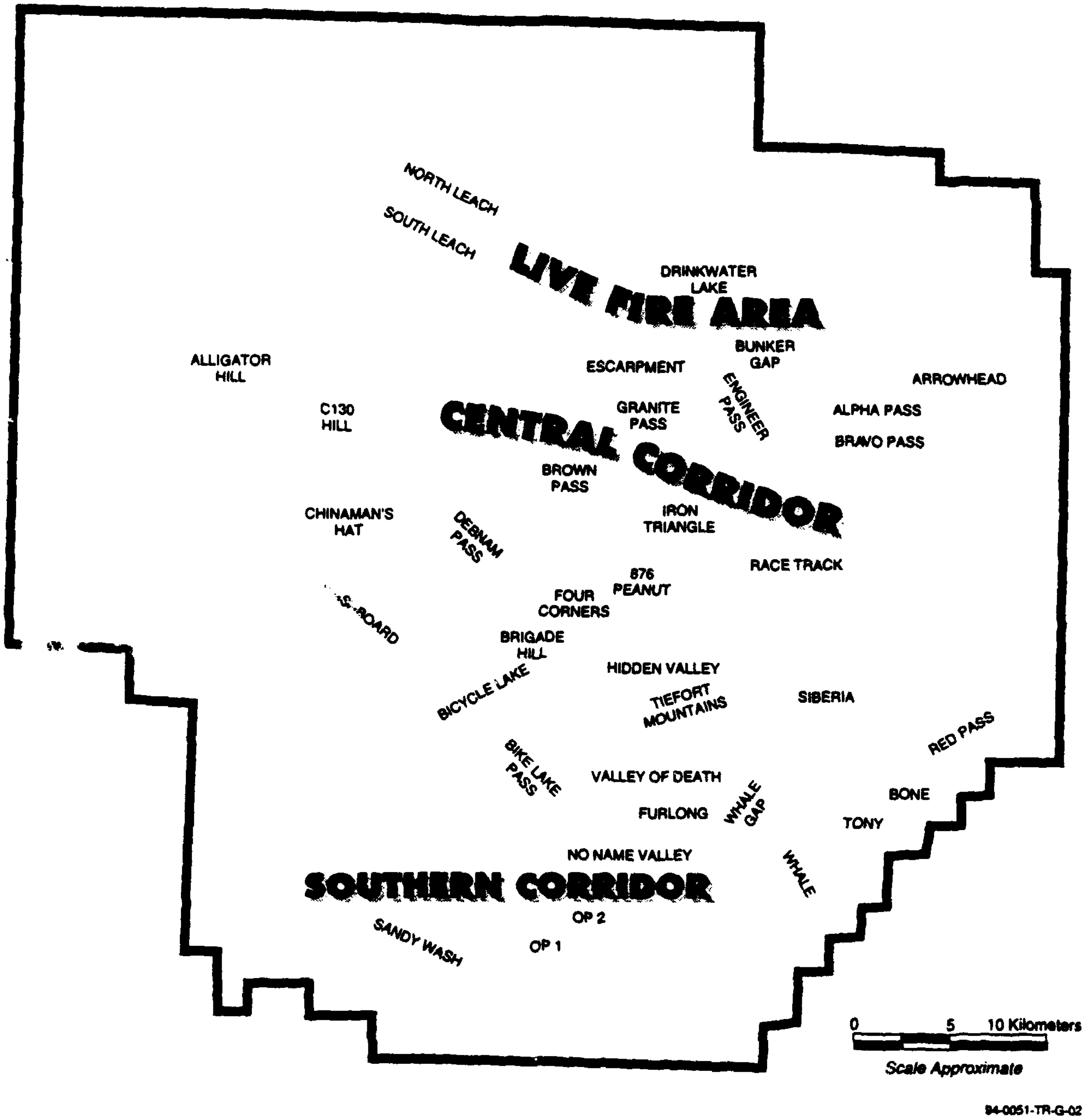

Figure 3-3. National Training Center Military Reservation Sketch Map

age levels of M1A2 experience, compared with the remainder of the task force. As a result, vehicle commanders from other units in TF 1-70 required substantial assistance in preparing CVCC M1 simulators for operations when they arrived for company team training.

3.4 SCENARIOS

TF 1-70 conducted its simulation-based training in three echelon-based stages. The scenarios supporting each stage were tailored to support hands-on training with the IVIS system by those who were to use IVIS-equipped vehicles, and tactical employment of both IVIS-equipped and non-IVIS vehicles according to the model depicted in Figure 3-2. All exercises were conducted on the NTC terrain data base. A sketch map of the NTC, annotated with key terrain features and major reference points, is depicted at Figure 3-3.

3.4.1 Platoon Training Scenarios

Platoon training was conducted on October 1-15, 1993. It was based on the execution of three tactical scenarios. These scenarios were developed by the task force staff, and controlled by the Team B commander. The scenarios consisted of a deliberate defense, a deliberate attack, and a movement to contact, executed in that order. The three scenarios were conducted as company level exercises. The unit executes each scenario at least twice. The first run was to check the basic scenario, to ensure that the scenarios supported the training objectives. The second run was conducted as a "record" run, similar to an external evaluation.

Orientation (Day 1/Oct. 1.) The support staff conducted a site orientation, then supported familiarization training for the unit. The primary focus during familiarization training was on navigation, formations, and tactical movement.

Platoon Defense (Days 2, 3, and 6/Oct. 4, 5, and 8). The company established defensive positions North and West of Brown and Debnam passes, as part of a task force defense. Adjacent BLUFOR elements were simulated using SAFOR. The OPFOR attacked through the Brown/Debnam pass area with a motorized rifle battalion, reinforced (MRB+) acting as an advance guard, and a motorized rifle regiment (MRR) as the main body.

Platoon Attack (Days 4 and 7/Oct. 6, 11). The company attacked through the Whale Gap to Red Pass, as part of the task force. Team B led the attack on Red Pass, supported by an adjacent BLUFOR company team. The OPFOR defense consisted of a combat security outpost (CSOP) west of Red Pass, a motorized rifle company (MRC) defending on the reverse slope east of Red Pass, and a tank company counterattack force northeast of the pass.

Platoon Movement to Contact (Days 5 and 8/Oct. 7, 12). The company attacked from the vicinity of the Race Track, and oriented on Brown and Debnam passes to destroy the OPFOR Advance Guard Battalion. Team B acted as the lead element in a task force movement to contact, with other company teams represented notionally. The OPFOR consisted of a motorized rifle platoon acting as the Combat Reconnaissance Patrol (CRP), a MRC, reinforced (MRC+) as the forward security element, and the advance guard (2 MRC+). The OPFOR attempted to fix and bypass the manned company and seize dominant terrain in the vicinity of the Race Track. Initial contact occurred near Hill 876 and the Peanut.

Road March (Day 1/Dec. 13) TF 1-70 began the operation in a tactical assembly area (TAA) in the Southern Corridor. The TF executed a tactical road march through the Whale Gap and Siberia, into the Central Corridor, to the vicinity of C-130 Hill. Upon arrival, the TF occupied a new tactical assembly area. The TF was unopposed in this operation.

Task Force Defense (Day 2/Dec. 14). TF 1-70 began in the TAA from the previous afternoon, preparing for a movement to defensive positions in the Southern Corridor. The TF was attacked in the TAA by a MRB in typical march order: platoon size CRPs, followed by a MRC+ acting as a forward security element. This formation was followed by a threat MRB+ in the advance guard role. OPFOR elements approached the TAA from the west and northwest.

After successfully defending the TAA, the TF was reconstituted in a TAA just south of the Whale Gap. Units prepared and occupied defensive positions in the OP 1/OP 2 area, oriented west.

Task Force Defense (Day 3/Dec. 15) TF 1-70 began the day making final preparations to defend in the Southern Corridor. The OPFOR probed initially with divisional reconnaissance assets, then followed with a MRB+ in typical approach formation: CRPs (platoons), followed by a forward security element (MRC+), then the advance guard MRB.

As the TF completed destruction of the OPFOR lead MRC, the remainder of the OPFOR MRB moved northeast toward Bicycle Lake. The TF received a Fragmentary Order to defend in an adjacent sector to the north. The TF withdrew, leaving one under-strength company (Company A) in defensive positions, and passed through the Whale Gap and Siberia. As the TF moved north, an OPFOR MRC+ attacked to fix Company A. As the TF entered the Central Corridor vicinity Siberia, it encountered lead elements of an OPFOR regiment attacking from the west.

Movement to Contact (Day 4/Dec. 16). TF 1-70 began in a TAA in the Central Corridor, then attacked west through the Brown/Debnam Pass area to seize an objective vicinity Alligator Hill. The OPFOR deployed platoon-size observation posts in the Brown/Debnam Pass area, a CSOP vicinity C-130 Hill, and a MRC+ in the objective area. Upon destruction of the OPFOR, the TF consolidated the objective. After consolidation, the TF withdrew to defensive positions vicinity the Peanut and Hill 876.

Task Force Defense (Day 5/Dec. 17). The TF began in the defensive positions established on the previous afternoon. The OPFOR deployed divisional reconnaissance assets and up to two MRCs that attacked to seize Brown and Debnam passes. The OPFOR then conducted a regimental attack through the passes with two MRB+ leading, and one MRB+ following to penetrate the BLUFOR defensive positions.

A second iteration of the defense was conducted in the afternoon, beginning with the OPFOR east of the passes and just out of contact with the TF's main defensive positions.

Task Force Defense (Day 6/Dec. 18). The TF began in a TAA just to the southeast of the Drinkwater Lake area. The TF deployed into defensive positions and defended against an OPFOR regiment attacking in typical march formation, preceded by divisional reconnaissance elements. This scenario replicated the defensive portion of the NTC live fire exercise.

3.4.2 Company Team Training Scenarios

Company team training used three scenarios, with each company team assuming specific missions based on their typical roles according to the TF standing operating procedures (SOP). The three scenarios were: defense, attack, and movement to contact, executed in that order. These scenarios closely resembled those used for platoon level training. Training was conducted and supervised by the task force headquarters. The dates in parentheses correspond with those for the A, B, C, and D company teams.

Company Team Defense (Day 1/Dec. 1, 4, 7, 10). The TF established defensive positions north and west of Brown and Debnam passes with three company teams (A, B and D) oriented on the passes, and C company (-) in reserve. The OPFOR attacked in typical march formation with up to a MRR in the main body.

Company Team Attack (Day 2/Dec. 2, 5, 8, 11). The TF attacked through Whale Gap to seize Red Pass. The TF seized the objective with one company team (Team A) supporting by fire, two teams (B and D) attacking through the pass, and C company (-) in reserve. The OPFOR defended with a CSOP west of Red Pass, an MRC east of the pass, and a counterattack force of up to one tank company. An OPFOR security force of one motorized rifle platoon (MRP) and two tank platoons defended the passes near Siberia to guard against an encircling maneuver to the north.

Company Team Movement to Contact (Day 3/Dec. 3, 6, 9, and 12). The TF attacked through the Central Corridor oriented on Brown and Debnam passes, to destroy the OPFOR forward operating detachment (FOD). The TF deployed in a Y formation, led by the scouts and Team Strike. The TF formation included two company teams moving abreast, followed by two company teams moving along the center of the corridor, in trail. The OPFOR consisted of three platoon-size CRPs, a MRC+ acting as the forward security element, a MRB+ as the advance guard, and an MRR as the FOD. The FOD's mission was to bypass the BLUFOR and seize terrain vicinity the Race Track. Contact typically occurred in the vicinity of the Peanut and Hill 876, with both the BLUFOR and OPFOR maneuvering to meet their objectives.

3.4.3 Task Force Training Scenarios

Task force training was conducted by 194th Brigade, using a series of tactical scenarios developed by the 3rd Brigade, 24th Infantry Division (Mechanized).[2] The scenarios were generally designed to flow together as a series of continuous operations, to replicate a typical NTC rotation. The task force commander changed the unit's task organization according to each mission. On Dec. 13 - 18, 1SGs monitored the battle using stand-alone IVIS emulators and CB radios and communicated with the TF CTCP using an LCU running B2C2 software. However, neither 1SGs nor any logistics elements moved about the battlefield in the simulation. Logistics operations were emphasized on the last day of training (Dec. 18) with a LOGEX, in which 1SGs and aid vehicles were incorporated in the simulation using M1A2 and M1 simulators, as shown in Table 3-3.

[2]TF 1-70 will be attached to 3rd Brigade, 24th Infantry Division (Mechanized), during the NTC rotation.

age for the Social Sciences (SPSS™). (SPSS™ is a registered trademark of SPSS Inc.) After developing SPSS™ control files for each data file, the research scientist used SPSS™ routines to produce output which aided a quality check of the data for each measure. The research scientist carefully reviewed the output to identify potential problems such as invalid values, missing values, or otherwise suspicious patterns in the data. Apparent problems with the data were taken to the senior analyst for investigation and resolution. This process usually required reprocessing some data. Occasionally analytical algorithms had to be revised to correct certain problems. This quality control cycle continued iteratively until all problems with the data were resolved. The end result was a set of six collapsed files containing the final data for all automated measures.

LOGEX (Day 7/Dec. 19). The TF LOGEX began in a TAA vicinity Arrowhead Hill. The TF attacked through the Bunker Gap area, to an objective vicinity North and South Leach passes to replicate the offensive portion of a NTC live fire exercise. The OPFOR consisted of CSOPs in the Bunker Gap area and an MRC+ on the objective.

3.5 AUTOMATED DATA COLLECTION AND REDUCTION

The resident Data Collection and Analysis (DCA) capabilities of the MWTB provide the automated means to capture and reduce performance data based on packets from the simulation Ethernet data stream. The basic DCA capabilities were described at the end of Chapter 1. Many of the measures of performance (MOPs) contained in the evaluation plan (Appendix A) were identified as automated DCA measures. The list of these measures, developed as a joint effort of DCD analysts and support staff research scientists, appears in Appendix C.

Working with the list of automated measures, a support staff research scientist developed operational definitions for all measures. The set of definitions can be found in Appendix C. The MWTB senior analyst implemented the operational definitions by developing software code for each measure, using C programming language. For some of the measures, adaptation of existing software was sufficient; for others, new software was required. As the analytical algorithms were developed, a support staff research scientist reviewed trial outputs based on sample data and provided feedback to the senior analyst for refinement of the algorithms. The actual algorithms are available from the MWTB senior analyst.

An SGI Indigo computer workstation was used to record Ethernet packets to disk during the execution of all task force scenarios. A DCA clock unit generated real time signals to be recorded with the data stream. As recording proceeded, the PVD operator/event flagger monitored the battle's progress using a PVD and a table-top radio unit set on the task force command frequency. He used the PVD's event flagging utility to input event markers ("flags") to the data stream. These flags corresponded to key tactical events such as a unit crossing the line of departure, and they served to define data elements during subsequent data reduction.

Before automated data reduction could begin, support personnel had to transfer the recorded data in the following sequence: from SGI disk to SIMNET DataLogger disk, then to DataLogger tape, and finally to the DCA MicroVAX™ computer's disk. (MicroVAX™ is a trademark of the Digital Equipment Corporation.) These steps involved no screening, filtering, or processing.

Generating the processed data files was a collaborative effort involving the senior analyst and a support staff research scientist. The MicroVAX™ analysis system applied the analytical algorithms to the raw data recorded directly from the data stream, supplemented with flag-based input in the form of times marking specific computational requirements. Information assigning each friendly vehicle to its proper unit within the task force was input to ensure that vehicle-based data elements could be aggregated correctly. Intermediate data files were integrated to form "collapsed" files organized suitably for personal computer data analysis. The support staff research scientist processed the initial collapsed files using the Statistical Pack-

works had to be split between projects as well as between sites. A shortage of available CB nets meant that the administrative voice net (used for initializing vehicles, calling for technical support, and routine coordination) was largely unavailable during the first few days of company team level training. The floor monitor was told to refrain from using the administrative net due to bleedover onto radio nets being used by other training units at the MWSTC. As a result, the floor monitor had to physically move between sites to provide technical support and relay messages which slowed down the coordination process considerably.

Good communication is vital for effective scenario execution as well as effective coordination. During the HI Experiment, radio nets were assigned down to the platoon level to conduct task force operations. The number of required nets exceeded the number of available channels. Future training and evaluation efforts at the task force level would benefit from the development of a new radio communication system offering more channels and more robust operations.

4.1.1.2 CIG and Network Limitations

The combination of many vehicles, minefields, artillery impacts during heavy shelling, and very detailed terrain on the NTC database frequently overloaded the CIGs. This overload resulted in substantial "bluing" in the drivers vision blocks in most vehicles, making navigation difficult. Some vehicles which were particularly close to the minefields had all the simulator vision blocks turn blue as the CIG tried unsuccessfully to paint each minefield marker. The simulator crews were, in effect, "blinded," and ceased participation in the training until the scenario was over. The stealth station also stopped painting terrain features during periods of extremely heavy CIG demand, hindering SMEs from monitoring the progress of the battle. A second, less frequent result of CIG overload occurred when manned vehicles simply stopped processing friendly and/or enemy vehicles. Vehicles sometimes crashed into other friendly vehicles whom they could no longer see. The problem of CIG overload increased in defensive or task force scenarios where many vehicles moved closely together.

In addition to CIG overload, the large number of simulation elements in the HI Experiment resulted in network abnormalities. Throughout the conduct of company team and task force exercises, the PVD showed manned simulators and SAFOR flashing on and off the screen. The MCC controlling the MWTB provided false reports of simulators falling off the net during periods of extremely heavy load. On two occasions, the MCC used to control MWSTC simulators crashed.

4.1.1.3 Simulator Issues

Frequent technical difficulties involved M1, M2, and GDLS M1A2 simulator hardware and software. Several of the M1s had recurring squeals in the radio headsets caused by radio power supply faults. Others had frequent Interaction Device Control (IDC) board faults which prevented ammunition from being loaded and/or redistributed or faulty ammunition door lights which provided erroneous visual cues on the availability of ammunition.

Some peculiarities of the GDLS simulators were the result of the software unique to those simulators. The GDLS simulators have damage tables that do not respond to 30 mm OPFOR

CHAPTER 4
LESSONS LEARNED

This chapter documents observations and suggestions made by the research staff who supported the HI Experiment. It addresses issues of general interest to the design and conduct of DIS-based training and or/data collection to facilitate the planning and conduct of similar efforts in the future. A separate report containing the research objectives, data obtained, and results and findings of the HI effort is being prepared by the MWBL.

This chapter first discusses general lessons learned concerning simulation systems and the methods used to conduct the HI Experiment. These general lessons learned pertain to at least two of the three stages involved in the HI effort (i.e., platoon, company team, and task force). Following the general lessons learned are equipment-related and methodology items specific to each of these stages.

4.1 GENERAL

4.1.1 Basic Simulation Systems

4.1.1.1 Radios

Radio communication problems were the most prevalent technical difficulty encountered during company team and task force level HI exercises. Problems encountered with the SINCGARS radios included (1) bleedover from one net to another, (2) garbled and/or broken communication, (3) no communication at all, and (4) radios that spontaneously transmitted all crew intercom communications over the radio net. These problems occurred although the SINCGARS model used was not representative of that used in the field (i.e., no radio interface unit, terrain degradation, or distance degradation). SINCGARS simulator radio problems like bleedover, garbling, etc., while annoying and difficult to troubleshoot, are not new at the MWTB.

Radio problems became even more pronounced when the MWSTC and the MWTB sites were networked together. Task force members lost several training hours while technicians adjusted radios to facilitate communication between the two sites as well as within each site. Problems with CB transmissions between the two sites were exacerbated by problems in wiring, in the number of radios being linked together, and by the distance the signal had to travel in the two buildings. There were also problems with the DVGs which connected SINCGARS (digital) and CB radios on the same network. For example, on the first day of task force training, 13 Dec., there was no radio communication between the two sites until approximately 1400 hours. To facilitate better voice communication between the two sites, one of the two DVGs was placed at the MWSTC.

Linking the two sites during company team and task force training exacerbated the problem of bleedover between adjacent radio nets. In a typical CB system, 40 frequencies are available. However, because adjacent frequencies increase the likelihood of bleedover, only 20 networks are actually usable. In the HI Experiment, the MWSTC and the MWTB had to share these 20 networks. Furthermore, the MWSTC supported other training units during much of the team and task force level HI training; the 20 net-

inputting a minefield is entering a grid incorrectly; in the case of a minefield that is too big, adding another minefield is not a viable option. Twice during HI, mistakes were made when inputting minefield grids, resulting in unrealistically large minefields. If it were possible for the minefield to be marked before it was emplaced, the location could be verified visually on both the PVD and through simulator vision blocks prior to actual emplacement. Thus, if the placement were wrong, it could be modified before the minefield became effective. Also, the CEC should allow for modification or deletion of minefields without having to end the exercise.

4.1.1.5 Terrain Database Compatibility

The NTC terrain database used for the HI Experiment had to undergo the removal of some very detailed terrain and some incompatible soil types so that it was amenable to CVCC simulators: a relatively time-consuming process. The use of a CVCC-compatible terrain database in a future exercise would provide some labor savings. The use of a database that is already installed on the MWSTC would result in even more savings, particularly when multiplied by the number of simulators used at the MWSTC. For the HI Experiment, technicians frequently brought up the MWSTC simulators on their standard Fort Knox database rather than the NTC database, necessitating that the simulators be taken down and the NTC database be reloaded.

4.1.2 IVIS-E and CVCC Software Issues

Lessons learned and subsequent suggestions for improving the software have been categorized as follows: (1) improvements to the IVIS-E software designed to emulate the actual fielded IVIS, (2) improvements in the interface between the GDLS IVIS and the IVIS-Es, and (3) improvements for the CVCC TOC workstation/IVIS-E interface.

4.1.2.1 IVIS Emulators

The software engineers did a commendable job of creating and implementing the new IVIS-E software platform prior to the start of the HI effort. Software development continued during the HI Experiment to resolve software bugs and upgrade the IVIS-Es through the tireless efforts of the software engineers and the DO manager. However, there were several critical areas in which the IVIS emulators did not effectively duplicate the capabilities of the current GDLS IVIS. For example, the IVIS-E could not display more than a single overlay at one time, unlike the GDLS IVIS. This limitation was particularly troublesome for commanders who wished to display an operations overlay simultaneously with an intelligence and/or obstacle overlay. Also, minefields on a TOC workstation-created overlay appeared on the IVIS-E map displays as a row of circles without a box outline. Small minefields were virtually indistinguishable from friendly vehicle icons until this IVIS-E problem was fixed toward the end of the HI Experiment.

Another IVIS-E shortcoming was the lack of a reliable recover function such as the battery-backed Random Access Memory capability available on the GDLS IVIS. When an IVIS-E crashed early in the HI Experiment, the system lacked the capability to recover any of the information entered by the user, including user ID and the IVIS radio settings. The user would have to re-enter the information and have all

guns or artillery. There was also a software bug that caused the simulation system to lock up when a large number of vehicles were within 3500 meters of a GDLS simulator. This bug was fixed in a different version of the GDLS code but not in the code delivered to Fort Knox.

Other problems plagued the GDLS simulators more often than the other simulators. One GDLS simulator shut itself off every 2-3 minutes for three consecutive days. GDLS simulators were also more prone to drop off the simulation net when the network became heavily loaded (usually during an engagement). The crews in the affected simulators often missed the engagement waiting for their simulators to come back up on the simulation network.

Unfortunately, on most training days, no spare simulators were available at either the MWTB or the MWSTC for crews to move to if they were having recurring simulator problems. There was also a shortage of available spare parts, particularly for the GDLS simulators. When one GDLS simulator gunner's control display panel stopped working, there was no spare part for fixing it. In efforts where training and/or data collection are being executed, a few backup simulators and a ready supply of spare parts will provide insurance against loss of training time, data, and crewmember morale.

4.1.1.4 Experiment Control Equipment Issues

SAFOR version 3.10.3, used in this experiment, did not optimally support HI operations. Problems with tethered vehicles breaking tether and running away from the manned vehicles were common. The operator's ability to react to a broken tether was directly proportional to his span of control; the more vehicles he had under his control, the less likely he was to recognize and react to a broken tether. Friendly SAFOR vehicles often broke tethers when mired in slow-go terrain. Reattaching the tethers to their manned vehicles increased the workload of the friendly SAFOR operators and decreased their responsiveness in handling other SAFOR vehicles. Future scenarios conducted on the NTC database should be designed to avoid slow-go terrain as much as possible. When slow-go terrain and chokepoints are unavoidable, units should expect and plan for the detrimental impact untrafficable terrain has on SAFOR tethering and responsiveness.

Minefields, unlike untrafficable terrain, are not displayed on SAFOR terminals. Unless forewarned or guided by other control personnel, SAFOR operators have no indications of a minefield and can only maneuver around them by guesswork. Moreover, SAFOR version 3.10.3 does not support breaching minefields or any other obstacles. As a result, for the HI effort, SAFOR obstacle breaching operations had to be carefully contrived. In future simulations involving SAFOR version 3.10.3, minefields must be carefully implemented, and exercise controllers should thoroughly brief friendly SAFOR operators on how and when to approach, breach, and report minefields within the context of the scenario.

Once placed, minefields become permanent for the duration of the exercise. There are ways to clear lanes through minefields using initialized engineer assets (i.e., line charges) but not to remove them without ending the exercise from the SCC. There is also no way to modify existing minefields once they are placed other than by placing another minefield to increase the area covered. The most common mistake made when

tually, IVIS-Es had to be installed in place of the GDLS IVISs during company training.

4.1.2.3 Interface Between the IVIS/IVIS-Es and the TOC Workstations

There were several limitations of the interface between the CVCC TOC workstation software and the IVIS and IVIS-E software used in the simulators. First, the logistics functions suffered from incompatibility between the TOC workstation and IVIS and IVIS-E platforms. The IVIS and IVIS-Es did not send out logistics status packets in a form recognizable to the TOC workstation logistics and task organization modules. Also, the IVIS and IVIS-E software contained an extended SPOT report format which permitted the operator to input fuel and ammunition information for his own vehicle and subordinate units. However, much of the vital information was not translated when it reached the TOC workstations. If the ITRANS were modified to associate specific IVIS-equipped vehicles with a duty position in the tank-pure Armor battalion expected by CVCC, the TOC workstations could probably translate the logistics information received from the simulators into its logistics module. As a workaround during the HI effort, technicians placed an IVIS-E in the BCV which provided the TOC staff with access to the full IVIS SPOT report.

Overlay translation from TOC workstation to IVIS/IVIS-E was sometimes problematic using the ITRANS. Occasionally, commanders were unable to receive an updated overlay. A workaround involved deleting the current overlay and then asking the originator to retransmit it. (See Appendix F for ITRANS documentation.)

During the company team and task force exercises, the TOC workstations were brought up each day containing the reports and overlays from previous days. Since new overlays had to be titled one of the five IVIS-compatible names (e.g., OPS1, OPS2), overlays remaining from other days had to be re-saved under other names, a time-consuming and tricky process due to the eight-character restriction on overlay names on the TOC workstations. Solutions to this overlay naming problem could include broadening the list of overlay names the IVIS-E will accept as well as modifying the TOC workstations to accept names with more than eight characters.

4.1.3 Methods

4.1.3.1 Functional Testing

Due to scheduling constraints and lack of equipment availability, only limited functional testing was completed before the start of the company team training. Consequently, some software problems were not resolved until the second week of the effort. Also, the problems with the voice link between the two buildings were not discovered during functional testing because the MWSTC was not available to support the effort. For future efforts the scale of the HI Experiment, functional testing should involve the complete network and last at least two full days. Also, earlier arrival of new software and a formal checkout of the experiment's equipment (e.g., IVIS-E acceptance testing) would have resulted in earlier identification and repair of software and hardware bugs and incompatibilities between platforms.

Using soldiers unfamiliar with the basic simulators and/or IVIS equipment they were evaluating made the actual functional testing process

overlays and important messages sent to him again. As the HI effort progressed, the software engineers worked diligently and developed a recover function that saved overlays, messages, and IVIS radio settings. However, a software bug remained that prohibited the IVIS-E from showing the correct grid location for its navigation functions. Subsequently, the IVIS-E recover function was not used.

Other IVIS-E problems were less critical but still noteworthy. First, the IVIS-Es operated faster than a fielded IVIS. This could mislead troops into expecting better responsiveness on the IVIS at the NTC. The absence of the RIU had research implications as well (see subsection 4.2.3.2). Another problem with the IVIS-E software was its poor integration with the thumb control. The cursor moved erratically when operated by the thumb control, frustrating the IVIS operator. By the end of company team training, all IVIS-E operators had been provided with a mouse control or a trackball to use instead of the thumb control. Soldiers operating the IVIS-Es were disappointed that the file management capabilities of the GDLS IVIS were not available on the IVIS-Es.

The IVIS-E displays and hardware also caused participants concern. The IVIS-E display in the CVCC and M2 simulators did not fill the high resolution monitors, making the graphics difficult to read. Conversely, the IVIS-E display (when used in lieu of a built-in interface) did a better job filling the available monitor screen but the 19" monitors themselves were unwieldy and obstructive for the participants. A related problem was the difficulty with the IVIS transceiver cables at the MWSTC. Crews trying to reposition the large IVIS-E monitors with their rolling carts frequently loosened the connecting cables and deactivated their IVIS-Es. The transceiver cables had to be taped in the sockets to help prevent this from happening. Also, the IVIS-E screen saver was a black screen, which frequently led participants to believe their IVIS-Es had crashed when all they had to do was click the mouse to reactivate the screen. Finally, the rolling carts supporting the IVIS-Es were top-heavy due to the large monitors and were too low for the commanders to easily divide their attention between the vision blocks and IVIS-Es.

4.1.2.2 Interface Between the GDLS IVIS and the IVIS Emulators

Connectivity and report routing problems surfaced between the GDLS IVISs and the IVIS-Es during the HI Experiment. The GDLS IVIS sometimes did not establish connectivity (i.e., link up) with other IVIS emulators on the net. Once the GDLS IVIS encountered a duty position or call sign entered in a format it didn't recognize, it stopped linking up with other simulators. Unfortunately, in the HI simulation, the GDLS IVIS did not recognize the 1SG or FIST as valid duty positions. The workaround used for the HI effort was to bring up the GDLS IVISs first, followed by the IVIS-Es (with the exception of the 1SGs and/or FISTs). Finally, the 1SG/and or FIST could be brought up on the net without impeding the IVIS-Es from linking up digitally with other simulators.

Also, the GDLS IVISs had trouble processing all the network and message traffic and could not keep up with the IVIS-Es. Icons would drop off the screen or the IVIS would simply crash. This IVIS processing problem began appearing the company team exercises and grew progressively worse in the task force exercises. Even-

pated in the dry runs. This also would have been an excellent opportunity to confirm selected aspects of the communications network, observe the scenarios, and investigate the use of aviation or other assets not addressed in the original scenario packet. The interaction between SAFOR operators and the task force staff might also have facilitated more realistic expectations between the two at the start of company team training.

It was presumed that all of the vehicle commanders would be IVIS qualified so that the IVIS emulator usage skills would be easier to acquire. In actuality, many of the vehicle commanders (particularly the infantry elements) had no IVIS training. The task force intended that IVIS proficient troops would train novice users. However, the congested HI schedule did not allow for this training "on the fly." Training prior to the beginning of the evaluation would have been preferable, whether conducted by the support staff or by the unit. Once the basic usage skills were taught and the evaluation began, a mentoring system with experienced IVIS users from the unit acting as resources for less-experienced participants could be implemented effectively.

The two IVIS usage skills which vehicle commanders seemed to have the most difficulty in acquiring were (1) setting up their IVIS communication pages, and (2) displaying IVIS overlays. Commanders often had difficulty understanding that the IVIS radio settings had no connection to the SINCGARS or CB radio settings. Each unique combination of IVIS radio parameters defined a separate net, so the IVIS communication page settings had to be executed perfectly to enable the users to communicate digitally on the same net. (IVIS report routing tables are shown in Appendix E.)

Once they got their IVIS communication nets set up correctly, HI participants experienced difficulty in receiving and handling overlays. First, the TOC staff sometimes failed to follow the established overlay titling conventions they were instructed to use, resulting in IVIS or IVIS-E operators pulling up blank overlays. Conversely, IVIS or IVIS-E operators often thought their posted overlay was blank when the overlay did not overlap the terrain segment currently displayed on their digital maps. To help IVIS operators locate an overlay, the TOC workstation operators began a convention of announcing the grid location of the center of the overlay so the recipients could rescale or scroll their maps to see it. Ultimately, the IVIS-E should display a reference location for each overlay to help orient the operator. Although significant improvement in IVIS usage was usually seen in commanders by the third day of company team training, errors made in incorrectly setting up IVIS radio nets and in displaying received overlays were made through the final day of task force level training as new commanders rotated into IVIS-supported simulators.

Even participants who became quite proficient in using IVIS-Es to support their assigned units were confused about how to set up their user ID, company ID, and IVIS radio nets when cross-attached to another unit. A few minutes training time in the morning to cover how to set up IVIS-Es when cross-attached would have been beneficial.

4.1.3.3 Scenario Development and Delivery Procedures

Earlier collaboration between the MCC/SCC operator (an expert in the capabilities and limitations of the simulation systems) and the military personnel creating the scenarios for the HI

more difficult. Although soldier participation allowed the support personnel to man many more simulators than would have been otherwise possible, lack of troop familiarity with the basic simulators and/or IVIS slowed the functional test, and the results were less reliable than could be expected with participants more proficient with simulators and the IVIS.

4.1.3.2 Training

Crews participating in a combined training and data collection effort like ? I must be knowledgeable in two areas: (1) basic simulation systems, including the simulators themselves (M1, M2, or GDLS M1A2), radios, capabilities and limitations of SAFOR, etc., and (2) the specialized C^3 systems being evaluated such as the CVCC TOC workstation, the CITV, and the IVIS or IVIS-E.

Many participants at the MWTB did not know how to use the SINCGARS radios. During the first few days, the radio problems reported were frequently due to participants' inexperience with distinguishing between their "A" and "B" radios. The radio problems most commonly reported by participants at the MWSTC (i.e., transmissions received were distorted or were not received at all) were often due to operator error rather than equipment problems. Turning the volume up on the A or B radios at the MWSTC increased the distortion. Turning the volume all the way up actually shut the volume off. If the soldiers could have been trained to use their wall monitors to adjust the volume rather than the CB radio volume adjustments, at least half of the reported radio problems involving distortion or no communication at the MWSTC site could have been prevented by the operators themselves.

Ignorance of other basic simulation operating procedures (many of which mimic operating principles of the actual M1, M2, or M1A2) also caused unnecessary technical problems at both sites. Participants repeatedly ran their engine batteries down, because they didn't put the vehicles in tactical idle or ran the turret power without the engine power. They also complained of engines that wouldn't start, when, in fact, the vehicle was in "drive." Trying to fire a round with the breech open was also common. Mistakes of this nature were particularly understandable because crews were often in surrogate vehicles (e.g., medic crews in M1s rather than HMMWVs and infantry crews in M1s or M1A2s). Many participants were also unaware of the basic capabilities and limitations of SAFOR in regard to unit movement, C^3, minefields, and slow-go/no-go terrain. They expressed surprise that their SAFOR units had support staff who could send radio reports as well as operate the forces. A short simulator overview for each crew as well as a SAFOR briefing would have made the initial days of training run more smoothly.

In addition to needing training on basic simulation systems, many participants needed training on the digital C^3 systems. TOC workstation operators for the HI Experiment were supposed to be B2C2 proficient prior to beginning training. In fact, only half had any B2C2 experience at all. The exercise dry-runs made by SAFOR operators to verify the scenarios could have provided an opportunity to reinforce TOC staff training, instruct friendly SAFOR operators on the task force SOP, and allow selected task force staff personnel to observe how well the scenarios played out. If possible, key players within the S2, S3 and FSE sections could have partici-

measures and procedures for data collection in advance can the potential conflicts between training and research be resolved beforehand to the satisfaction of both the training and research proponents.

Another planning issue is the allocation of adequate resources to support equipment repair and maintenance at each site. There was only one technician at the MWSTC for the first ninety minutes of training one day, causing a backlog of technical problems and delaying the beginning of scenario execution. Resources should be available to provide three or more technicians at each site simultaneously, even on the weekends. Several technical problems necessitate two people working on them concurrently (such as checking radio communication between two locations). Although the two technicians supporting the MWTB on weekends worked hard to handle simulator problems, some crews were left behind in the battle while waiting for their simulators to be fixed.

Firm SOPs need to be established prior to beginning an experiment on scenario execution procedures such as dealing with killed, hit, or mired manned vehicles. Once established, the SOPs should be followed consistently. This allows the participants and support personnel to know what procedures will be followed each time for a particular situation so they can help expedite the process in a timely manner. Doing this will protect the quality of the data collected. Prior to the beginning of the HI effort, the MWBL representatives had deemed that vehicles would not, in fact, be reconstituted—even if their digital system were an important link in the IVIS chain of communication. However, during actual execution, killed vehicles were often reconstituted, sometimes as observers, sometimes as fully capable vehicles, depending largely on whether the commander had a unique IVIS link (e.g., if he was a company commander, his executive officer was already dead, and the platoon leaders with IVIS were still alive).

Reconstituting task force members as observers in particular caused problems with the continuing execution of the scenario. Destroyed task force scout vehicles were sometimes reconstituted without ammunition, in observer force alignment, to represent surviving, dismounted scouts. Since the OPFOR would not engage observer vehicles, and since many of the reconstituted scout vehicles were located in no-go terrain, they could continue to observe and report enemy movements as static, stay-behind observation posts. However, scout vehicles that were reconstituted as observers in trafficable terrain frequently began to shadow OPFOR formations in an entirely unrealistic fashion (e.g., moving in the open, protected by their "observer" status). Eventually, the control staff disabled such vehicles. If the observer mode is to be used in the future for the same purpose, the vehicle should be reconstituted without fuel to limit its mobility.

One inadvertent reconstitution of a BLUFOR vehicle during a mission reinforced another problem with using the observer mode. When the manned simulator was initialized with a defense force alignment and later reconstituted as an observer, other manned BLUFOR simulators appeared as threat vehicles to the observer crew. When the observer was brought up seeing other friendlies as threats and had ammunition, he began to fire on other manned friendly forces.

Vehicles mired in no-go terrain were treated differently from one mission to the next. Prior to the last two days of the training, they were

effort would have been desirable. The MCC/SCC operator could have worked more closely with the Army so that the scenario developers could have better assessed the impact of SAFOR capabilities and limitations on the execution of the scenarios. For example, limitations on the SAFOR's ability to react to the OPFOR air attack scripted in some of the scenarios resulted in inordinate losses due to OPFOR helicopter fires. In many cases, OPFOR helicopters were deployed against SAFOR elements exclusively, and the manned force was not forced to react to the air attack. Because of the unanticipated reduction in overall SAFOR strength, the manned company often became overwhelmed by the remaining OPFOR ground forces (e.g., one manned company team facing the majority of two OPFOR MRBs). Earlier coordination between the MCC/SCC operator and the scenario developers could have allowed the scenario developers to be better prepared for such contingencies.

Scenarios for the task force stage of the HI Experiment were not delivered to the support personnel until just prior to the start of the task force runs. The scenarios should be delivered at least two weeks before the first training exercise is to be executed. This would provide time for input of scenarios into the SAFOR computers, last-minute modifications to ensure compatibility with simulation capabilities, and trial runs of the scenarios. If scenarios are provided late, an extra burden is placed on SAFOR operators and the MCC/SCC operator who are faced with a large portion of the exercise execution tasks.

Finally, the scenarios were routinely modified by military personnel just prior to mission execution. There were only four SAFOR workstations that could be used for scenario input. Access to these computers for entering changes during the HI Experiment was very limited due to the continuous nature of the effort. As noted later in this chapter, the late delivery and constant changing of the scenarios provided obstacles to the collection of objective data. Once task force runs began, it was also decided to conduct the exercise as one continuous operation. This meant that vehicle locations and IVIS and TOC workstation status information had to be preserved throughout the task force level training. This was a labor-intensive process which used additional support personnel resources.

4.1.3.4 Planning and Execution Procedures

The short time between the awarding of the HI delivery order and the execution of the HI effort severely compressed the planning and preparation period. Frequent planning meetings and in progress reviews were excellent but began later than the scope of the HI effort warranted. Where both training and research are major goals of the effort, planning is more complicated. The Army and the contractors should establish relative priorities, agree to ground rules early, and assess the impact of planning decisions on both training and data collection.

The lack of a research plan meant that the research interests being pursued were unclear initially. An up-front requirement for a detailed Data Collection, Reduction, and Analysis Plan would clarify research issues and help ensure that adequate resources are provided for definition of performance measures, event flagging, data collection instrument development, conduct of DataLogger playbacks, data preparation for government analysis, etc. Only by defining the

simulators or less) included finding a technician and then standing by while a problem was fixed. For the HI effort, the MWSTC floor monitor limited herself to being a technical POC. Once she had turned the problem over to the site coordinators, she returned to a central location and made herself available to respond to all soldier problems and inquiries. The MWSTC floor monitor used the administrative net for coordinating reconstitution of a vehicle and to get clarification from the MCC/SCC operator at the MWTB on procedural issues. For future efforts involving more than eight simulators at the MWTB or the MWSTC, the role of floor monitor might well be limited to being a technical POC, and an administrative net should be provided to facilitate the technical repair and coordination processes.

There were also coordination issues between participants and support personnel. Unit changes in crew assignments or configurations occurred frequently without the support staff's knowledge. For example, on one occasion, two crews within the same platoon physically switched simulators. In several cases, some simulators with IVIS-Es had no commanders for days at a time. Unavoidable absences or crew changes may not be a significant detriment to training exercises but should be brought to the attention of the support staff and recorded so subsequent analysis and interpretation of data can be adjusted.

Before any changes are made to the radio or simulator configurations by the participants, the MCC/SCC operator should be consulted. The MCC/SCC operator can tell the military representative whether the proposed change is feasible and how lo it would take to implement the change, and he can notify all other contractor personnel on the change if implemented. For one scenario, the unit changed the radio net assignments without consulting the MCC/SCC operator. Two consequences were that the SAFOR were on a different net from the manned vehicles, and the unit had devised a scheme that was not supportable with the limited number of CB radios available in the ECR. While the most desirable solution would certainly be to increase the number of radio nets supportable for an exercise, the lesson learned by the participants was that all changes in simulation or radio configurations must be cleared with the MCC/SCC operator.

There were other participant-support personnel coordination issues. Unit coordination needs to be accomplished with the CEC operator prior to the scenario's beginning. One of the engineer platoon vehicles became the victim of fratricide because the CEC operator was still placing a minefield when the manned unit had begun to move. Also, the floor monitors should be formally introduced to the unit participants as the *only* POCs for technical support. This will assure that the floor monitors will be appraised of all technical problems so that they may be fixed and recorded for future reference. Finally, floor monitors need to know the names of military POCs who can provide soldiers and the support staff with clarification on the radio nets, simulator configurations, etc., being used.

OPFOR support personnel were sometimes confused when trying to determine whose guidance to follow in making changes to the scenario. Conflicting suggestions were often provided by various members of the unit staff. There did not appear to be one military representative in charge of making the final decision on changes to be implemented and of informing the support staff as well as the other unit mem-

reconstituted into a better area. On the last two days, mired vehicles had to wait for a recovery vehicle to notionally tow them out. The recovery vehicle execution did not go smoothly, and one vehicle was left mired in the no-go terrain for over two hours when his unit forgot to send the recovery vehicle.

An SOP should also be established prior to execution of scenarios to deal with the incidence of intentional fratricide. Prior to one mission, a company commander told his unit to kill all the friendly SAFOR vehicles in the company because they kept running into the manned vehicles. The decision on whether these SAFOR vehicles should be reconstituted to support the remainder of the mission was made extemporaneously. While it is acknowledged an event of this nature should not happen, a contingency plan should be determined in advance by the unit in case it does occur.

Another SOP issue that should be emphasized with a training unit is the need for four-man crews for M1s because training on the tanks at the NTC is executed with four-man crews. Although the use of the autoloader was allowed at the MWTB during the HI effort, the autoloader feature is not one routinely employed at the MWSTC. Furthermore, crews would frequently go from four-man to three-man and back to four-man crews on a daily and sometimes twice-daily basis, necessitating that their simulators be taken down to add or take away the autoloader function. An SOP quickly developed that changing one's autoloader status at the MWTB required a one-day notice. Vehicle commanders at the MWSTC were not given the autoloader option, even if they did not have the loader position manned.

4.1.3.5 Coordination

In a test the magnitude of the HI effort (i.e., two sites; up to 59 simulators; multiple contracts, each with separate contract teams; Task Force 1-70 participants and military support personnel; and the MWBL representatives), coordination was a key issue from the very beginning. It is commendable that, for the most part, the coordination went very smoothly. The key point of contact (POC) for one contractor was the MCC/SCC operator. The Delivery Order manager was the principal contractor team POC. He coordinated and disseminated schedules, simulator and test equipment configurations, and any last-minute changes to the mission or procedures with other supporting players.

Several coordination procedures are worth noting for future efforts. Looking first at coordination between support staff, the floor monitors and MCC/SCC operator designated in writing on the board above an MWTB simulator whether the vehicle used the autoloader option and would get ammunition. This helped the technicians to bring the simulators up in the correct configuration. The use of two floor monitors was a necessity. One was totally dedicated to the MWTB and the time of the other was split between the two sites throughout the company team training exercises. Once the task force level exercises began, the second floor monitor became totally dedicated to the MWSTC. This division of labor worked well.

The MWSTC floor monitor also took on a different role than that of the traditional floor monitor due to the large number of simulators (up to 45) which she was responsible for. Standard MWTB floor monitor procedures used in the past (earlier evaluations had involved eight

A task force operations order (OPORD), operations overlays, and initial positions for each friendly SAFOR unit were provided to the friendly SAFOR operators, but not a copy of the task force's SOP. Furthermore, friendly SAFOR operators did not participate in the task force OPORD briefings. When company team training began, friendly SAFOR operators had neither a firm grasp of the SOP nor as complete an understanding of the task force OPORDs as the other company commanders. Part of this discrepancy was corrected when the task force S-3 Air briefed the friendly SAFOR operators on the expected scheme of maneuver and reporting protocol prior to each iteration. As a result, Team D's training went more smoothly than Team A's because of the friendly SAFOR operator's increased understanding of the tactical situation in each scenario.

During company team training, key C^2 vehicles in each unit operated with IVIS capabilities, and FIST chiefs communicated with the task force FSE using DMDs. Unfortunately, there was no mechanism to effectively emulate the assumed digital capabilities of adjacent elements (SAFOR). As a result, tactical information that should have been digitally transmitted had to be verbally transmitted, diluting some of the training value. In future efforts, appropriate digital terminals and operators should be used to facilitate digital communications with SAFOR elements. In addition, automated position reporting from appropriate SAFOR elements, such as that available in SAFOR version 3.11.1, could be integrated into the exercise. However, SAFOR version 3.11.1 currently only runs on the Fort Knox terrain, so a new NTC database would have to be acquired to work with 3.11.1 on the NTC terrain.

Radio-telephone operators normally provide voice communication assistance to the friendly SAFOR operators. Their absence during the company team training increased the friendly SAFOR operators' workloads and limited the effectiveness of communications on the task force command and fire support networks. In order to accurately role play unit commanders and FIST chiefs on the radio networks, it would have been preferable to detail either junior officers or senior non-commissioned officers to assist the friendly SAFOR operators. One RTO per friendly SAFOR station would have been ideal.

4.2.3 Task Force Exercises

The following section documents exercise-specific observations made by support staff regarding the task force training exercises which took place from December 13 - 19.

4.2.3.1 Simulation Systems

It was at the task force level that problems with the basic simulation systems (radio communication, network and CIG overload, etc.) reached their peak. As increased numbers of manned and SAFOR vehicles moved together or encountered larger enemy forces, instances of "bluing" in simulator vision blocks occurred more frequently. The GDLS M1A2s "fell off the net" more often and stopped processing information. MCCs, PVDs, and the stealth station also crashed more frequently at task force level than during the company team training exercises.

The task force scenarios' requirements for OPFOR and friendly SAFOR support frequently exceeded accepted capabilities of the SAFOR systems and operators. When the blue forces

bers. For future efforts, having the unit staff coordinate and channel suggestions through one POC prior to suggesting changes to the OPFOR operators would simplify the scenario setup and execution procedures.

4.2 STAGE-SPECIFIC LESSONS LEARNED

4.2.1 Platoon Exercises

The following section documents the exercise-specific observations of the support staff during the platoon training exercises conducted on October 1 - 15, 1993.

4.2.1.1 Simulation Issues

Several IVIS-related problems occurred during platoon-level training exercises. The most limiting problem was the slow processing of IVIS information. When the IVIS message traffic increased, it took as long as 5-7 minutes for the messages to be processed and displayed. Sending overlays during periods of high message traffic increased report processing time to 10-15 minutes. Participants, impatient with the slow processing, entered too many keystrokes. This caused the IVIS system to crash and required rebooting of the simulator. Rebooting took the participants out of the mission for at least four minutes, and they often had to be reconstituted at a new location because their unit had left them behind.

4.2.1.2 Methods

Methodology lessons that emerged during platoon level training involved equipment training and the delivery and development of the training scenarios. Company B conducted IVIS and CITV hands-on instruction on the first day of the platoon-level training. It was beneficial to have the users undergo a day of familiarization training with the equipment prior to execution of their tactical scenarios. Participants could then concentrate on using the equipment tactically once they had the basic skills to use the test equipment.

The scenario information provided for the platoon level training lacked realism. The number of OPFOR vehicles initially portrayed exceeded any current OPFOR force structure. A more realistic unit structure would replicate NTC OPFOR, a Soviet style unit, or Iraqi forces and encourage the training unit to wargame the battle against the proposed enemy, analyze its capabilities, and evaluate courses of action to defeat it.

4.2.2 Company Team Exercises

The following section documents exercise-specific observations made by test support staff regarding the company team training exercises which took place from December 1 - 12.

Friendly SAFOR operators received the company team training scenarios with sufficient time to develop exercise files and to rehearse the scheme of maneuver. However, during the actual company team training, the scenarios were modified to increase the number and intensity of the enemy engagements. As a result, notable portions of the OPFOR operators' preparations became obsolete. Also, each of the three initial exercise files was based on a given unit formation. Frequently, units changed positions within the initial formation, forcing the two friendly SAFOR operators to delete and recreate units after the exercise file was loaded in order to maintain equitable spans of control.

The number of digital elements on the net during task force training also emphasized the need for initialization checklists for the TOC workstations, IVISs, and IVIS-Es. Initialization checklists, if implemented for future efforts, would help ensure that all the digital elements were brought up in the optimum order and in the correct configuration. These checklists, combined with the controller workstations discussed earlier, would become powerful tools in initializing, monitoring, and controlling the large number of digital systems used in an effort like the HI Experiment.

4.2.3.2 Data Collection and Reduction

The collection and reduction of voice and digital data at the task force level during the HI effort was challenging due to four factors: (1) the late arrival and fluid nature of the scenarios, (2) the data collection and reduction capabilities and limitations of the MWTB hardware, (3) the structure of the task force and new IVIS-E platforms, and (4) the sometimes conflicting requirements of training versus research. Late arrival of scenario overlays and lack of task force graphics kept the PVD operator from drawing in control points on the PVD to use for event flagging. Also, the absence of a finalized event script hampered development of data collection logs.

The lack of scripted (predictable) events made it very difficult to obtain certain measures (e.g., reaction time). In lieu of scripted events, a military SME was assigned the responsibility to sit at the stealth and relay flagging instructions over a CB to the PVD operator. However, due to other responsibilities, the SME was not able to do this consistently. So, with little guidance from SMEs, the PVD operator flagged these events on event flag logs (see Appendix D) using his own judgement. Preferably, in the future there would be more scripted events so that more objective criteria could be followed. However, to collect the more subjective measures, an SME needs to be in the loop consistently if "on the fly" flags are to be useful in data analysis later.

The MWTB data collection equipment was stretched to the limit to support the HI effort. Network capacity limitations necessitated recording voice radio traffic separately from the primary simulation data stream. Because of this, the capability to listen to voice communications when replaying recorded scenarios for AARs was not available for the HI Experiment. Further, the dual-medium recording of voice and simulation data seriously limited the ability to support review of recorded scenarios by SMEs. Future research would benefit substantially from the capability to record high-volume network data from both simulation and radio sources on the same medium.

The contractor team developed an innovative way to record voice data using video cassette instead of audio cassettes. To record a voice network, a CB output was fed into the VCR audio input. Radio traffic at company and task force levels was recorded. However, using one VCR to record one channel of voice data resulted in a large number of bulky cassettes for storage and later handling. This would increase the effort and time required to process the recordings for transcription of voice messages. A multi-channel audio recording capability could be developed to streamline the recording of radio traffic and reduce the workload involved in offline playback and transcription. Perhaps an even better option would be a multi-channel disk recording system.

were in the defense, the OPFOR attacked in regiment strength, causing the OPFOR machines to crash with uncharacteristic frequency. (One OPFOR station crashed four times in one two-hour mission due to system overload.) In future simulations, SAFOR limitations must be considered in scenario development and the allocation of manned and SAFOR elements. Also, SAFOR stations should be rebooted whenever possible during scheduled or unscheduled breaks of 30 minutes or longer to lower the risk of crashing the system due to a lack of memory. The long-term solution for the problem of SAFOR crashing would be to enhance the capabilities of the SAFOR software to provide greater processing capability.

During the task force scenarios, the span of control exceeded optimal levels for the friendly SAFOR operators. SAFOR planning guidance specifies that an operator can effectively manage 5-7 separate elements. During most of the task force training, friendly SAFOR operators were required to maneuver 10-14 individual vehicles (see subsection 3.1.4). Given that each individual vehicle generally had to be managed separately, the planning guidance was exceeded by a factor of two, with a resultant decrement in friendly SAFOR effectiveness. Given a visual acquisition range of 3500 meters, friendly SAFOR operators typically had to use a map scale of 1:50,000 or greater in order to observe all assigned vehicles and any enemy elements with which they had contact, depending on the dispersion of assigned elements. However, at those scales, friendly and manned SAFOR icons tended to become indistinguishable. These factors should be considered as potential problem areas in scenario design. A possible solution would be to provide more SAFOR stations when large numbers of elements are to be controlled.

TOC workstation, IVIS and IVIS-E operators became more confident with their test systems and used them more and more during task force training, loading the digital net accordingly. The overlays created on the CVCC TOC workstations became more ambitious and more detailed during task force training. Engineers made overlays that included minefields and other obstacles. The IVIS-Es often crashed when the operator tried to view overlays which included obstacles. The IVIS-Es inability to display more than one overlay, the growing problem of redundant reports and overlays, and the indistinguishable friendly vehicle icons (as many as 26 "o's") were amplified at the task force level. IVIS-E crashes became more frequent at the task force level as well, emphasizing the importance of having a central control workstation to activate and reboot IVIS-E systems at each site.

It was during task force level training that an IVIS controller workstation capability was implemented at each site. This allowed IVISs and IVIS-Es which had crashed to be recovered by software engineers at each site. An even better solution in the future might be to have a central controlling workstation on each side which could perform two functions on *all* the digital C^3 systems on the net: (1) indicate when an IVIS, IVIS-E, or TOC workstation has crashed; and (2) denote faulty states on the digital systems, including transceiver cable problems, split screens, POSNAV icons disappearing, etc. Expanding the central controlling workstation functions would allow the floor monitors to be more proactive in identifying and repairing digital system problems.

forms such as the IVIS-E are being evaluated. Finally, the processed data should be grouped logically by issue and measure type for ease of review.

The requirements of supporting training were sometimes at odds with the standardization intrinsic to research methodology. The variety of basic simulator and experimental C^3 equipment configurations used for HI raises questions about how to interpret the data collected. Looking first at the non-standard simulator equipment, there were differences between the simulators at the MWSTC and the MWTB. The most noteworthy differences were the optional autoloader and thermal sights provided on the CVCC M1s and GDLS M1A2s but not at the MWSTC. However, at the MWSTC, shooting azimuths to get friendly vehicle identifications in the M1s and the functioning grid azimuth indicators on M2s were features not available at the MWTB.

Turning to experimental C^3 equipment configurations, sometimes the GDLS M1A2 operators used GDLS IVISs, and sometimes they used IVIS-emulators. The converted CVCC M1s had CITVs and driver's displays which were different from those in the GDLS M1A2s. When GDLS vehicles were used to represent other vehicles, the drivers still had access to a compass and circuit breakers. Furthermore, none of the MWSTC vehicles had any CITVs or driver's displays at all. Finally, unlike the MWTB M2s which had been modified to include a lasing capability, the MWSTC M2s with IVIS had no capability to lase to enter grid coordinates into report. While this variety in basic simulators and in experimental C^3 equipment was necessary to support an effort the size of HI, the impact of so many different capabilities cannot be overlooked when the data are analyzed for performance differences.

Another variable aspect of the HI Experiment was its personnel. The Team Strike commander was absent for an entire day while the Strike platoon leader took over as commander. Even more frequently, crews showed up with their loader and/or gunner absent. Although this is expected in a training unit, when protecting the quality of data is important, the unit should consider troop availability throughout the effort as an important factor in staffing key positions.

Reduction of voice data is very time-consuming and costly because the current methodology involves manual transcriptions. New technologies aimed at voice recognition should be explored. A voice recognition system that fed directly into the DCA system would eliminate the need for manual transcription, resulting in a complete database at a faster rate and possibly at a lower long-term cost.

Once the HI effort's automated data were collected, the reduction process was complex and time-consuming. First, the data for the task force missions were logged using a Silicon Graphics Indigo workstation. From the workstation, the data were then transferred to a hard disk drive on a conventional DataLogger where the large data sets nearly filled up the hard disk. The data were then transferred to nine-track tape. From the tape, the data were then transferred to a hard disk on the MicroVAX™ for data analysis. The DCA MicroVAX™ disk had insufficient capacity to store all of the experiment's recorded exercises, which meant the data had to be read in and reduced one portion at a time. Once a portion of the data was completed, it was erased and the next portion was read in and reduced. If it became necessary to return to an earlier portion of the data, the DataLogger tapes had to be read in again before reduction could proceed. This sequence multiplied the processing time and increased the opportunities for processing errors. Upgrading the data analysis capabilities would be desirable in order to reduce the number of steps involved and streamline the reduction process. It would be highly desirable to upgrade the storage capacity of the DCA computer or to develop removable disk capabilities.

Resources permitting, a simpler solution might be to use a Sun DataLogger. The Sun DataLogger provides a much quicker turnaround of data by performing both logging and analyzing functions. Thus, the data would not have to be transferred to another machine and analysis of the data could begin as soon as the mission is completed. For future projects the option of using a Sun DataLogger should be explored. Also, space could be conserved on the DataLogger hard disk by stopping the DataLogger during breaks and starting it again when the mission resumed.

A modification in procedures as well as ADST hardware would have benefited the HI data analysis process as well. Because the requirement to ensure a valid HI Experiment database for analysis was levied only a few weeks before actual data collection began, the organizational structure of the Task Force was not considered as early in the data processing activities as would be desirable. The decision on what measures to collect on which echelons had to be made almost at the last minute. Research issues were identified late as well. Earlier identification of the research issues could have helped drive some of the software decisions rather than having research issues limited by the software. For example, had the radio interface unit (RIU) been implemented (providing realistic time delays and voice overriding digital transmissions like in the real IVIS), the HI Experiment could have provided a forum for collecting data on the optimal mix between voice and digital communication. Unfortunately, the identification of this research issue came too late, and the RIU had not been implemented.

Ideally, more data reduction and analysis time should be allocated when new hardware plat-

that message on the battalion network without retransmitting it on the company network.

- Implement a capability within IVIS to filter out or ignore duplicate messages and overlays.

5.1.2 ADST Capabilities Supporting Digital C^3 System Research

The following recommendations suggest ways to improve battlefield digitization research capabilities within the ADST environment. Suggestions address both hardware and software improvements to simulated digital systems, as well as ways to support simulated systems.

- Establish a central control node, capable of remote monitoring and initialization of all automated C^2 systems within the simulation, that would enable support personnel to investigate problems and recover systems (e.g., IVIS-E or CVCC TOC workstations) from a central location.
- Ensure that simulated digital C^3 systems can be recovered if technical problems occur, precluding the need to reinitialize the system during tactical operations.
- Update the GDLS IVIS software to mirror the current fielded version on M1A2s, and upgrade the overall system to improve reliability when networked in a larger simulation.
- Activate RIUs on SINCGARS equipped simulators within the simulation, so that digital burst communications are modeled realistically (i.e., so that digital burst transmissions must compete with voice transmissions).
- Install SINCGARS simulators (with RIUs) in all combat vehicles and command posts that have automated C2 systems within the simulation.
- If IVIS-Es are to support future efforts, upgrade the software to more accurately model the actual IVIS, develop a more realistic hardware interface for generic (MWSTC) simulators, and improve the interface between systems.
- If current CVCC and IVIS components are to be networked for future simulations, improve the interface between systems to enhance overlay and message handling, and eliminate the need for a central translator link such as ITRANS.
- Develop the capability to network actual B2C2 LCUs with the simulated IVIS network as an alternative to using CVCC TOC workstations as surrogate LCUs.
- Develop data links between automated C^2 systems and the MCC system to simulate automated data transfer from IVIS and/or B2C2 to TACFIRE or the Advanced Field Artillery Tactical Data System (AFATDS), and to reduce the likelihood of operator-induced errors when transferring data from one system to another.
- Where and when appropriate, integrate automated digital reporting to allow two-way data communication between SAFOR operators and manned elements.

5.1.3 General ADST Systems

The HI Experiment represented one of the most ambitious efforts undertaken within the ADST environment and, as such, demonstrated a number of limitations with the current technology. Future efforts of this magnitude will be similarly constrained unless and until the ADST environment is enhanced. The recommenda-

CHAPTER 5
RECOMMENDATIONS

Overall, the HI Experiment was successful from a technical support standpoint. Many of the lessons learned documented in the preceding chapter yielded recommendations for improvements to battlefield digitization research and to ADST procedures. This chapter recounts those methodological recommendations. Recommendations related more directly to operational issues and the design of research regarding the digitized battlefield may be found in the MWBL report.

5.1 BATTLEFIELD DIGITIZATION RESEARCH

Many of the lessons learned from this effort provide a basis for the continued development of digital C^3 systems to support combined arms operations. The recommendations in this section include issues relevant to automated C^2 research beyond ADST simulations, issues relevant to ADST simulations supporting the development of C^3 systems, and suggestions for the improvement of the ADST environment in order to better support future research and development efforts.

5.1.1 Digital C^3 System Research

The ADST simulation documented here and in the MWBL report was conducted in support of the Army's overall battlefield digitization research and development. The recommendations that follow are offered to support such research.

- Investigate standardized data protocols to facilitate data transfer between dissimilar systems (e.g., B2C2 and IVIS) and to reduce or eliminate the requirement for translator software. If the need for a translator program cannot be eliminated, install the translator on LCUs, to run simultaneously with the B2C2 program.
- Develop simplified routing matrixes to reduce the number of relays necessary for certain types of reports. For example, when a platoon leader sends a call for fire using IVIS, the company FIST should receive the message directly, without a relay from the company commander. Also ensure redundant routing for primary message types. For example, the company team commander, XO, FIST, and 1SG should each be able to receive messages from platoon level, and relay them to the battalion task force level.
- Develop utilities to simplify the implementation of task organization changes and to allow for net-wide initialization. For example, make it possible for the task force headquarters to modify the IVIS routing for a platoon that is chopped from one company team to another.
- Implement a friendly vehicle icon identification utility on the IVIS display, and develop the ability to aggregate vehicle icons at user-selected levels (e.g., platoon, company) in order to reduce display clutter and confusion.
- Provide for selective routing of IVIS overlays and messages, enabling a user to relay messages without retransmitting them back to the originator. For example, given a SPOT report from a platoon leader, the company commander and XO should be able to relay

- Plan for acceptance testing prior to functional testing to verify the capabilities and discover the limitations of new hardware and software systems (i.e., IVIS-E). Accomplish initial acceptance testing early enough to facilitate software revision or refinement and to allow training staff time for system familiarization and final training development activities prior to functional testing.
- Plan for at least two and preferably four days of functional testing in the case of an effort as extensive as HI.
- Ensure that functional testing adequately models the most extensive, most complex operational model anticipated during an actual exercise in order to fully load the simulation network and discover likely implications of a large-scale effort.

5.2.3 Training

The tactical simulations during the HI Experiment served as a training opportunity for the task force, so that the unit might learn to use automated C^2 effectively in a tactical environment. The crews' ability to fight realistically and effectively from the simulators, and the operators' ability to use IVIS and B2C2 were therefore important components of the effort. The lessons learned regarding individual skills training before the start of the actual experiment are reflected in the following recommendations.

- Plan sufficient training for soldiers and staff prior to functional testing in order to use contractor staff and soldier support effectively during functional testing.
- Ensure that vehicle crews are proficient in the operation of both the basic simulators and the experimental systems being studied prior to operational data collection. Where resources permit, use contract personnel to provide up-front training on simulation and experimental systems, as well as to monitor equipment status and usage during the experiment. Allocate sufficient time to this initial individual train-up.
- Once unit-level training has begun, accomplish remedial training using peer instruction within the unit during pre-operations preparation.
- Time permitting, brief all participants on what elements of the unit will be represented by SAFOR, how to communicate with SAFOR operators (e.g., what nets and calls signs to use), and the capabilities and limitations of SAFOR. Circumstances permitting, encourage participants to coordinate directly with SAFOR operators controlling subordinate, supporting and/or adjacent units.
- Design IVIS training to include exercises in changing duty positions and task organization. For example, platoon leaders should be trained how to change their IVIS configuration if they assume command of the company or if their platoon is chopped to another unit.

5.2.4 Scenario Development, Support Staff Training, and Exercise Preparation

The following paragraphs offer recommendations to improve scenario development and coordination, support staff training, and exercise preparation.

- Coordinate scenario development and data collection requirements in order to ensure that opportunities exist for specific performance measures. Identify events within the scenario that should be "flagged" for data collection and analysis and develop logs and/

tions below suggest ways to improve the existing ADST environment, to better support future crew-level, soldier-in-the-loop research and development.

- Enhance the capacity and reliability of the MCC system through hardware and/or software upgrades to prevent MCC malfunctions.
- Upgrade vehicle simulator host computers and CIG capabilities to reduce the likelihood of vision block bluing and general simulator system failures during large-scale operations.
- Upgrade SAFOR systems in order to improve overall simulation realism and reliability, particularly in large-scale operations.
- Upgrade the combat engineer simulation to verify obstacle locations (e.g., minefields) visually prior to emplacement on the database, and more effectively simulate engineer coordination with manned units.
- Develop a more comprehensive exercise logging capability in order to reliably capture voice communications as well as simulation data packets.
- Improve simulation radio capabilities to reduce the likelihood of bleedover between different exercises and adjacent frequencies.
- Improve the operator interface on simulator radios to look and operate more like the controls on actual combat vehicles.

5.2 ADST PROCEDURES

The HI Experiment yielded a number of recommendations regarding ways to enhance ADST operations, both in terms of simulation preparation and execution, and in coordinating and providing technical support and liaison. The recommendations that follow address: (1) technical planning and preparation, (2) the functional testing of new hardware and software, (3) participant training, (4) scenario development, (5) support staff training, (6) exercise preparation, and (7) general issues relevant to the MWTB.

5.2.1 Planning and Preparation

Due to several factors, the amount of time available to plan and prepare the simulation test bed for the HI Experiment was relatively short. The procedures recommended in the following paragraphs should improve future efforts within the ADST environment.

- Implement a design freeze on key aspects of the experiment (e.g., routing tables and experimental configuration) to avoid last-minute changes and minimize impact on the budget. Limit software development following that date to fixing bugs within the current design.
- Deliver and install software with sufficient time to conduct acceptance and functional testing, and to implement necessary adjustments to soldier training plans and simulation support requirements (e.g., simulator configurations, scenarios, network requirements) after functional testing.

5.2.2 Functional Testing

Functional testing for an effort like the HI Experiment verifies the capabilities of new systems (e.g., IVIS-Es and ITRANS), the interoperability of systems not previously networked (e.g., CVCC and IVIS simulators), and overall system and network readiness. The magnitude of the HI Experiment and the limited time available for functional testing yielded a variety of lessons learned, as previously documented in Chapter 4. The following recommendations suggest practical ways to improve functional testing in future operations.

upcoming NTC rotation. The lessons learned and recommendations from the HI Experiment provide decision makers and researchers with vital information that can be used to prepare and conduct more effective exercises in the future.

or scripts to support the data collection effort.

- Conduct scenario rehearsals with a representative unit command group and all support personnel prior to unit training. Use SAFOR to represent all maneuver elements, to shake out the scenarios and to instruct BLUFOR operators on the task force SOP.
- Consider simulation limitations during scenario development in order to reduce potential problem areas due to system limitations. Determine acceptable risk levels, work-around techniques, and priorities, as well as procedures to be followed in the event of likely contingencies.
- Freeze scenario design early enough to allow support personnel time to finalize control files and perform necessary file maintenance. Avoid last minute changes unless absolutely necessary to the overall effort. Consider the effects on the data collection process before implementing changes to the scenario.
- Avoid implementing changes to established radio frequency assignments without consulting the MCC/SCC operator.
- Ensure direct coordination between the CEC operator and the unit commander responsible for siting obstacles, in order to more realistically model maneuver unit/engineer work party coordination.

5.2.5 Test Bed Issues

The following recommendations would continue to improve the MWTB's ability to support general research efforts.

- Maintain a software development environment at the MWTB which enables software engineers to create and test their latest code. The success of the HI effort highlighted the criticality of locating the software development area in the simulation bay to allow easy access to simulators. A "hot bench testing" capability at the developer's home location facilitated limited "up front" testing and was a key element in the HI Experiment's software development as well.
- Upgrade the data analysis capabilities at MWTB to streamline the data reduction process and eliminate multi-step data transfer.
- Ensure that a sufficient supply of spare parts (e.g., M1A2 gunner's display) is on hand throughout the experiment to avoid delays and lost training or data collection opportunities. Where possible, allocate back-up simulators as a hedge against equipment problems.
- When multi-site operations are conducted, establish coordination early-on to identify and resolve potential issues. Establish points of contact at both sites, and establish standing procedures for likely problems (e.g., simulator allocations, radio network management, facility access, and simulator malfunctions). Assign a staff member at the remote site with specific responsibilities for exercise control liaison with the primary site and technical liaison between participants and site support staff at the remote site. Ensure appropriate administrative communications means between sites in radio network allocations.

5.3 CONCLUSION

The HI Experiment provided task force 1-70 the opportunity to train with automated C^2 devices that were functionally similar to the IVIS and B2C2 systems they will employ during their

CHAPTER 6
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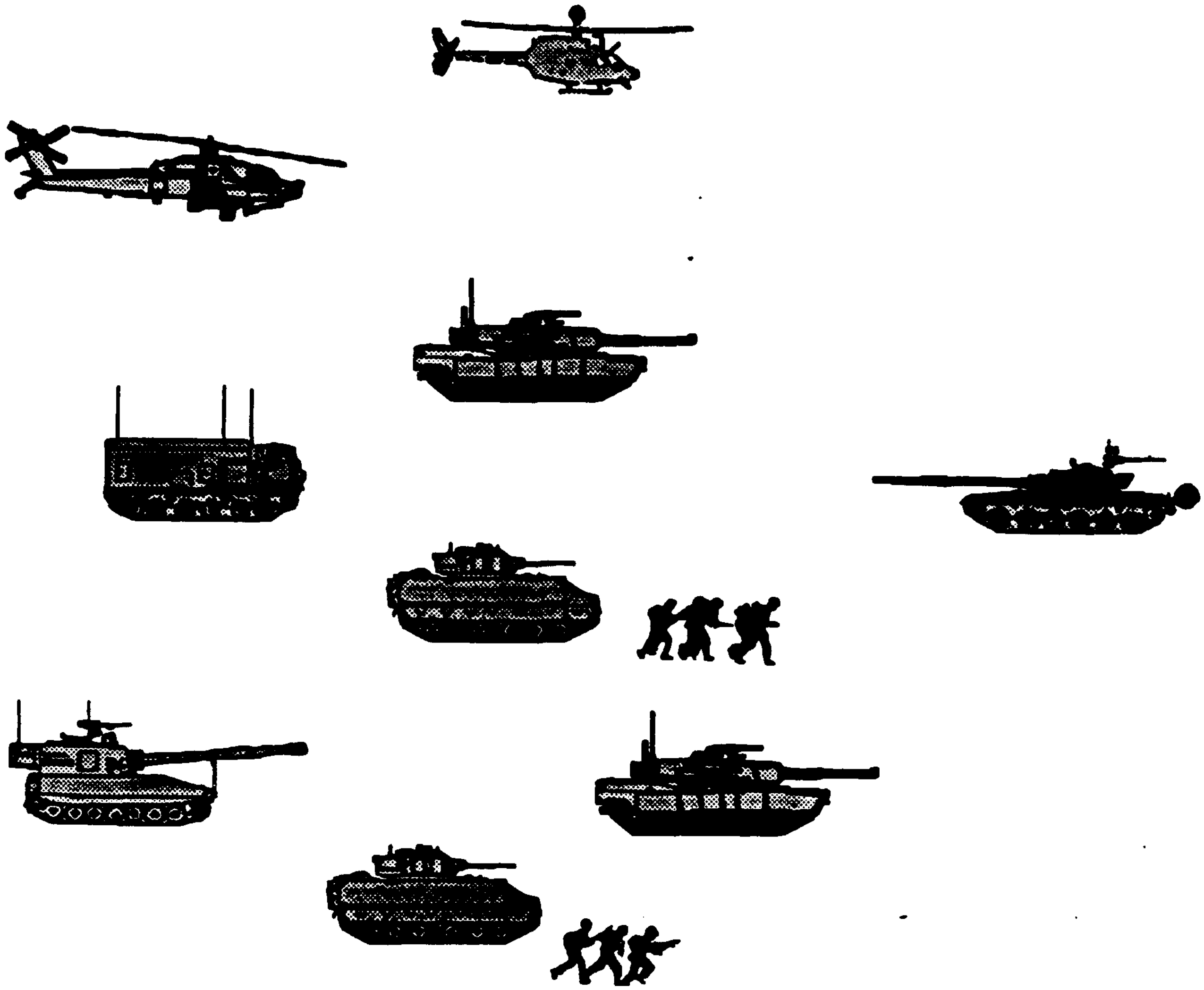
APPENDIX A

EVALUATION PLAN

THE CENTER

OPERATION DESERT HAMMER VI EVALUATION PLAN



AS OF 1 DEC 93

As of 1 DEC 93

Operation Desert Hammer VI
Evaluation Plan

1. Concept. Operation Desert Hammer VI and related events are designed to explore the impact of digital command and control on the modern armored battlefield. As part of the exercise this evaluation plan is structured to assess the impacts across Doctrine, Training, Leadership, Organizations, Materiel and Soldiers. The intent of this exercise is to point the way forward for the Army's doctrine, training strategies and materiel. The exercise is also intended to demonstrate the added value of digital systems.

2. References.

a. Statement of Work for Horizontal Integration (Battlefield Synchronization) Battlefield Distributed Simulation-Developmental (BDS-D) Linked With Combined Arms Tactical Training Center (CATTC) Support for Task Force 1-70 Armor 94-07 NTC Simulation Exercise 13-15 October 1993, 11 August 1993.

b. Statement of Work for Horizontal Integration (Battlefield Synchronization) Battlefield Distributed Simulation-Developmental (BDS-D) Support for Task Force 1-70 Armor 94-07 NTC Simulation Train-Up, 12 August 1993.

c. Statement of Work for Horizontal Integration (Battlefield Synchronization), 23 August 1993.

d. Third Wave Battle Command Mission Need Statement.

e. Third Wave White Paper.

3. Scope and Study Objectives.

a. Scope. The issues surrounding Operation Desert Hammer cut across Doctrine, Training, Leaders, Organizations, Materiel and Soldier issues (DTLOMS), Battlefield Operation Systems (BOS), and includes training preparation as well as the actual rotation. In addition, this Advanced Warfighting Demonstration will be analyzed to determine the potential future integration of Advanced Warfighting Demonstrations, and operational testing of developmental items of equipment.

(1) Due to the wide focus, we will collect information during battalion and brigade simulation training, 1-19 December 1993; platoon external evaluations, 10-20 January 1994; task force gunnery, 7-23 February 1994; NTC Rotation 94-07, 3-16 April 1994, and all preparatory training for these events.

(2) Fort Knox, TRAC, other TRADOC schools and independent agencies will collect and analyze data from these events based upon their involvement in the exercise. As the coordinating agency for evaluation, DCD, USAARMC will integrate the insights, analysis, and results of all these events into a final report.

b. Constraints.

(1) The training fidelity of the rotation will be maintained at all costs.

(2) There will be limited baseline comparison of the simulation and training impacts.

(3) TF 1-70 will train with IVIS version 2.2 software for the December simulation, but use version 2.3 software during the April NTC rotation. In the December simulation TF 1-70 will be limited to the systems available in the Mounted Warfare Test Bed (MWTB).

(4) Tactics, Techniques and Procedures (TTP) for the digital task force are in draft form being revised by the 194th Armored Brigade. These TTP are based on available experience, and will undergo modification as TF 1-70 gains new insights into the functioning of a digitally integrated battalion/task force.

(5) The training progression required to train/sustain digital user skills will be developed based on insights gained during the evaluation.

c. **Primary Objectives.**

(1) To determine the impact on warfighting capability of a digitized battalion/task force.

(2) To determine the effect of digital command and control.

(3) To examine the impact of digitally linking all battlefield operating systems at the battalion/task force level.

(4) To examine the impact of digitization on doctrine, training, leadership, organizations, materiel and soldiers.

(5) To determine the effects on lethality, tempo and survivability of a digitized battalion task force.

d. Secondary Objectives.

(1) Reinforce/support findings of the M1A2 Initial Operational Test and Evaluation.

(2) To identify and suggest further IVIS/B2C2 software improvements.

(3) To capture warfighting insights on all digitized/developmental systems used.

(4) To determine training insights on use of Distributive Interactive Simulation as a training tool.

4. Issues.

a. **Doctrine**.

(1) Does digitized battle command require refined doctrine/TTP changes at BDE and below? For a mixed BN/TF?

(2) Does digitized battle command impact tempo?

(3) Does digitized battle command influence lethality?

(4) Does digitized battle command affect survivability?

(5) Does digitized battle command require standardized IVIS SOPs for BN/TF and slice elements?

(6) Does digitized battle command extend the lethal range/battlespace of the BN/TF?

(7) Does digitized battle command alter the ability to mass forces?

(8) Does digitized battle command change situational awareness and reduce incidence of fratricide?

b. **Training**.

(1) Does digitized battle command require new individual and unit training tasks?

(2) Does digitized battle command require a new institutional or unit training strategy? Do initial training and sustainment training requirements change?

(3) Does digitized battle command require new training evaluation methods?

c. **Leaders**.

(1) Does digital battle command require leader personal competency/task proficiency?

(2) What type of information management does digitization require?

(3) Does digital battle command require a skill/intelligence level above the present standard?

(4) Does digital battle command assist in faster decision cycles/reaction times?

(5) Does digital battle command impact on the best use of available time (troop leading procedures, staff planning process)?

(6) Does digital battle command impact on commander and his staff?

(7) Does digital battle command permit/improve intelligence fusion?

d. **Organizations**.

(1) Does digital battle command offer potential for force design improvements?

(2) Does digital battle command improve TOC functionality?

(3) Does digital battle command eliminate need for TOC?

e. **Materiel**.

(1) How do digital systems contribute to the BN/TF?

(2) How do digital systems differ from existing systems?

(3) How do digital systems need to be modified for an objective system?

f. **Soldiers.**

(1) Does digital battle command require special skills?

(2) Does Third Wave battle command require a minimum competency level?

(3) Does Third Wave battle command increase educational requirements?

(4) Does Third Wave battle command intensify demands on soldiers during periods of increased tempo?

(5) Does Third Wave battle command change workload distribution?

(6) Does Third Wave battle command change tasks by skill level?

(7) Does digitized battle command require a higher minimum skill level?

(8) Does digital battle command create information overload?

5. Data Collection/Analysis Plan.

a. The issues and means by which data is collected for Operation Desert Hammer VI and related exercises varies as training occurs.

(1) Company, Battalion and Brigade Simulation Training - The primary means of data collection for these events is the SIMNET data logger. In addition, questionnaires, AARs, and SME input may assist in the evaluation.

(2) Platoon External Evaluations - The primary means of data collection for this event is observation and AARs. In addition, videotaped movement, questionnaires, and SME input may assist in the evaluation.

(3) Task Force Gunnery - The primary means of data collection for this event is the M1A2 gunnery tables. AARS, videotaping, and SME input may also assist.

(4) NTC Rotation 94-07 - This event requires the bulk of the data collection effort. The means of data collection include DCD/16 CAV questionnaires, videotaped NTC AARs and post rotation

debriefs, recordings of digital and voice transmissions, O/C comments, SME comments, IVIS base stations, NTC hyperbattle database and download of MILES/TWGSS information. Other means post-rotation include MWBL output and ARI/POM database information. See Appendix E for specific responsibilities.

b. Analysis Plan. Upon completion of each event, each agency will conduct an analysis of collected data, to determine insights on appropriate issues. As this analysis is completed, the results will be provided to DCD, USAARMC for consolidation and incorporation into post-exercise reports. The final product for Operation Desert Hammer VI and related events will be a review of all data collected, as well as the results of comparison to other NTC rotations, Janus/ELAN comparisons, and other analysis.

c. An NTC Hotwash and emerging insights briefing will be conducted during the first week of May 1994. This will be followed by ARI/POM loading digital information for battle playbacks. Janus and ELAN runs will be conducted during the first couple weeks of June 1994, as well as receiving information from RAND and ARI. An NTC data review will occur during the last week of June. A draft report will be published during the middle of July 1994, with a final product completed the end of July. See Appendix A for specific events and dates.

d. One key challenge to this evaluation is lack of an established baseline for comparison. Data collection will focus on perceived differences between digitized and non-digitized battalion/task forces. Efforts will be made after these events to quantify the results. This may be accomplished by using some or all of the following methods:

(1) NTC collection of rotations 94-04, 94-05, 94-06, and comparison of digitized NTC results to similar battles in NTC database.

(2) Comparison of take home packages to packages already in ARI-POM database.

(3) Creation of Janus replicas of each battle to permit comparison of changes in battle command systems.

6. Evaluation Responsibilities.

a. Specific Instructions.

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(1) **MWBL**

(a) Overall exercise coordination.

(b) Source of all taskings.

(2) **DCD, USAARMC**

(a) Coordinating agency for data collection and analysis.

(b) Focus on combined arms and horizontal integration issues.

(c) Prepare data collection products.

(d) Compare NTC rotation to previous battles and rotations.

(e) Conducts baseline to digital comparisons through Janus.

(f) Publish evaluation report.

(3) **ARI-Fort Knox**

(a) Support data collection and analysis during all simulation training.

(b) Provide doctrinal, training development and training insights.

(4) **CALL/ARI-POM**

(a) Construct digital take home packages and battle playbacks by 1 July 1994.

(b) Incorporate NTC collected data from all available sources as soon as possible (if available).

(5) **TRAC (TRAC-WSMR)**

(a) Assist in preparing data collection products.

(b) Attempt to conduct baseline to digital comparisons by duplicating NTC battles in Janus.

(c) Perform analysis of the potential for AWDs to fulfill some/all of the operational testing requirements.

(6) **OPTEC/TEXCOM**

(a) Determine what can be done to improve NTC instrumentation for operational testing purposes.

(b) Augment NTC instrumentation to the extent possible for NTC 94-7.

(7) **RAND**. As part of ongoing studies:

(a) Determine digitization's impact on fixing longstanding BN C2 issues.

(b) Analyze the impact of computerized or automated C2 on mission outcome at the battalion level and below.

(c) Propose changes to training, tactics and organization to reduce identified problems with battalion and below command, control and communications.

(8) **NTC**

(a) Assist in data collection.

(b) Assist in determining digital to baseline differences.

(c) Provide take home packages to Knox/TRAC by 1 July 1994.

(9) **16th Cav, USAARMC/DOES** - Conduct analysis of doctrinal and training development insights gained through Operation Desert Hammer VI and all related events.

(10) **Aviation School** - Provide resources per Appendix E to evaluate aviation issues.

(11) **Infantry School** - Provide one O-3 Co/Team and one E-7 Mortar Platoon SMEs to evaluate infantry issues.

(12) **Intel School** - Provide one O-3 brigade SME to evaluate intelligence issues.

(13) **FA School** - Provide resources per Appendix E to evaluate artillery issues.

(14) **ADA School** - Provide one O-1 ADA SME to evaluate air defense issues.

(15) **Engineer School** - Provide resources per Appendix E to evaluate engineer issues.

(16) **CASCOM** - Provide resources per Appendix E to evaluate logistics issues.

(17) **Battle Command Lab** - Provide resources per Appendix E to evaluate appropriate issues.

(18) **CDR, CCAC** - Provide resources per Appendix E to evaluate appropriate issues.

b. Coordinating Instructions.

(1) December Advanced Warfare Demonstration (and preparatory events).

(a) Issues for incorporation into Data Collection Plan due NLT 15 Nov 93.

(b) Input for incorporation into final report due NLT 15 Jan 94.

(2) January Platoon External Evaluation (and preparatory events).

(a) Issues for incorporation into Data Collection Plan due NLT 1 Dec 93.

(b) Data Collection Plan production 20 Dec 93.

(c) Input for incorporation into the final report due NLT 21 Feb 94.

(3) February Task Force Gunnery (and preparatory events).

(a) Issues for incorporation into Data Collection Plan due NLT 3 Jan 94.

(b) TF Gunnery Data Collection Plan production 17 Jan 94.

(c) Input for incorporation into the final report due NLT 14 Mar 94.

(4) April National Training Center Rotation (and preparatory events).

(a) Issues for incorporation into the April NTC Data Collection Plan due NLT 18 Feb 94.

(b) NTC Data Collection Plan production 7 Mar 94.

7. Resource Requirements. Personnel and agency requirements for data collection will vary by event. See Appendix B for specific requirements.

8. POCs for this action are MAJ Witsken and CPT Branscom, DCD, USAARMC, DSN 464-1346/3648.

List of Appendices.

Appendix A - Milestone Timeline

Appendix B - Issue Measures of performance Crosswalk - TBD

Appendix C - Issue Event Collection Crosswalk - TBD

Appendix D - Points of Contact - TBD

Appendix E - Resource Requirements - TBD

Appendix F - AWD Evaluation Plan

Appendix G - SME Questionnaires

Appendix H - Participant Questionnaires

Appendix I - TF 1-70 December Calendar

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APPENDIX A
MILESTONE TIMELINE

Draft O/C Questionnaires/Cards to NTC	NLT 15 Nov 93
Data Collection Plan Refinement	During Nov
Exercise IPR	18 Nov 93
CO/BN/BDE Simulation Training Collection	1-19 Dec 93
Exercise IPR	3 Jan 94
Platoon External Evaluation	10-20 Jan 94
Task Force Gunnery Collection	7-23 Feb 94
NTC Rotation Collection	3-23 Apr 94
Data Reduction/Analysis	Apr-Jul 94
Fort Knox NTC Hotwash	10-11 May 94
NTC provides ARI-POM Take Home Package	13 May 94
NTC Emerging Insights Briefing	18 May 94
ARI-POM loads NTC battle playbacks	NLT 16 May 94
Janus/ELAN NTC runs	1-15 Jun 94
ARI/RAND input to DCD, USAARMC	15 Jun 94
ARI-POM automated Take Home Pkg/Playbacks complete	15 Jun 94
Agency Reports Provided to DCD	1 Jul 94
Draft Report Published	15 Jul 94
Final Report Published	31 Jul 94

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APPENDIX B
DTLOMS
ISSUES/MEASURES OF PERFORMANCE

I. DOCTRINE

d1. Does digitized battle command require refined doctrine/TTP changes at BDE and below? For a mixed BN/TF?

Sub-issue. Does digitized battle command require refined doctrine/TTP for the differentially distributed force?

d1.1 What doctrine/TTP did the unit start with?
d1.2 What adjustments were made?
d1.3 What is recommended now?
d1.4 Did mixed digital C2/voice C2 problems occur?
d1.5 What was done to overcome problems?
d1.6 What is recommended in the future?

d2. Does digitized battle command impact tempo?

d2.1 Time required to complete operations?
d2.2 Specific observations
d2.3 Time for companies to reach objectives
d2.4 Unit dispersion
d2.5 Mean time out of sector/axis/misoriented

Sub-issue. Does digitization enhance breaching operations?

Coordination between assault, breach, and support forces.
Speed of executing breach operations.

Sub-issue. Does digitization enhance countermobility operations?

Speed of obstacle planning.
Speed of obstacle status reporting.
Dissemination of obstacle location information.

d3. Does digitized battle command influence lethality?

d3.1 At what ranges did the Blue force engage?
d3.2 How many systems fought in the battle?
d3.3 What was the total number of calls for fire?
d3.4 How many long range fires were there?
d3.5 At what ranges was the enemy destroyed?
d3.6 Were there any fires into the depth of the enemy position?
d3.7 Total number of reported acquisitions
d3.8 Number of enemy kills over time
d3.9 Loss exchange ratio
d3.10 System exchange ratio

d4. Does digitized battle command affect survivability?

d4.1 Loss exchange ratio
d4.2 System exchange ratio

d5. Does digitized battle command require standardized IVIS SOPs for BN/TF and slice elements?

d5.1 What SOPs were developed/used?
d5.2 What adjustments?
d5.3 What is recommended now?

d6. Does digitized battle command extend the lethal range/battlespace of the BN/TF?

d6.1 Range the enemy was engaged
d6.2 Range the enemy was killed

d7. Does digitized battle command alter the ability to mass forces?

d7.1 Total number of systems in the firing

d8. Does digitized battle command change situational awareness and reduce incidence of fratricide?

d8.1 Number of blue systems engaged by blue forces
d8.2 Number of blue systems destroyed by blue forces

II. TRAINING

t1. Does digitized battle command require new training tasks?

t1.1 For each soldier?
t1.2 For each leader?
t1.3 For each team?
t1.4 Across BOS tasks?

t2. Does digitized battle command require a new training strategy?

t2.1 Individual training strategy by BOS
t2.2 Leader training strategy by BOS
t2.3 Collective training strategy by BOS
t2.4 TADSS structure
t2.5 Frequency of training
t2.6 COFT-like training progression

t3. Does digitized battle command require new training evaluation methods?

t3.1 Train to mastery
t3.2 Digital second nature
t3.3 Over training
t3.4 Job books

III. LEADERS

l1. Does digital battle command require leader personal competency/task proficiency?

l2. What type of information management does digitization require?

l2.1 Quantity of voice/digital messages in/out at each level
l2.2 Leader workload measures

l3. Does digital battle command require a certain minimum skill/intelligence level above the present standard?

l4. Does digital battle command assist in faster decision cycles/reaction times?

l5. Does digital battle command impact on the best use of available time (troop leading procedures, staff planning process)?

l5.1 Changes in the staff planning process?
l5.2 Increase/decrease in speed of executing the staff planning process?
l5.3 What did TF 1-70 plan to do?
l5.4 What did TF 1-70 actually do?
l5.5 Shortcuts in planning process permitted by digital C2?
l5.6 Easier time management?
l5.7 Better parallel planning?
l5.8 Easier preparation of plans and orders?
l5.9 Easier/better/faster briefing/dissemination of orders?
l5.10 Troop leading procedures?

l6. Does digital battle command impact on commander and his staff?

l7. Does digital battle command permit/improve intelligence fusion?

IV. ORGANIZATIONS

o1. Does digital battle command offer potential for force design improvements?

o2. Does digital battle command improve TOC functionality?

o3. Does digital battle command eliminate need for TOC?

V. MATERIEL

m1. How do digital systems contribute to the BN/TF?

m2. How do digital systems differ from existing systems?

m3. How do digital systems need to be modified for an objective system?

VI. SOLDIERS

s1. Does digital battle command require special skills?

s2. Does Third Wave battle command require a minimum competency level?

s3. Does Third Wave battle command increase educational requirements?

s4. Does Third Wave battle command intensify demands on soldiers during periods of increased tempo?

Sub-issue. Does digitized battle command have an impact on the rest/sleep cycle?

Sub-issue. Does digitized battle command have psychological impacts?

Sub-issue. Does digitized battle command impact situational awareness?

Sub-issue. Does digitized battle command cause any system safety problems?

Sub-issue. Does digitized battle command cause any health hazard?

s5. Does Third Wave battle command change workload distribution?

s6. Does Third Wave battle command change tasks by skill level?

s7. Does digitized battle command require a higher minimum skill level?

s8. Does digital battle command create information overload?

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APPENDIX C
ISSUE EVENT CROSSWALK
LEGEND

RESPONSIBLE AGENCIES	ABBREVIATION
ARI Presidio of Monterey	ARIPOM
BDM	BDM
MWBL	MWL
RAND	RND
TRAC	TRC
TRAC-WSMR	TRW
TEXCOM	TXM
FORT BENNING	FBG
FORT BLISS	FBS
FORT HUACHUA	FHA
FORT IRWIN	FIN
FORT KNOX	FKX
FORT LEE	FLE
FORT LEONARDWOOD	FLD
FORT RUCKER	FRR
FORT SILL	FSL

MEANS OF DATA COLLECTION	ABBREVIATION
SIMNET Data Logger	SDL
SIMNET Data Logger Battle Playbacks	SBP
Subject Matter Expert (SME) AARs	SAR
Videotaped NTC AARs	VNA
Videotaped SIMNET AARs	VSA
Data Collection Questionnaires	DCQ

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Aerial Videotaped Raw Footage	**ARF**
Videotaped Raw Footage	**VRF**
Audio Recording of Radio Nets	**ARN**
M1A2 Gunnery Scoresheets	**MGS**
Videotaped Post Rotation Debriefs	**VPD**
NTC Hyperbattle Database	**NHD**
MILES/TWGSS Information	**MTI**
NTC O/C Collected Data	**NOC**
NTC Fort Knox Hotwash	**NFH**
SME Comments	**SCS**
ARI/POM Database	**APD**
Digital Equipment Skills Test	**DST**

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

	EVENTS							
ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
	AGENCY	MEANS OF COLLECTION	AGENCY	MEANS OF COLLECTION	AGENCY	MEANS OF COLLECTION	AGENCY	MEANS OF COLLECTION
d1								
d1.1	BDM	ARN, SBP	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.1	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d1.1	FBS	SCS, DCQ					FBS	DCQ, SAR, SCS, VPD
d1.1	FHA	SCS, DCQ					FHA	DCQ, SAR, SCS, VPD
d1.1	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD
d1.1	FKX	SCS, DCQ					MWLFKX	SCS
d1.1	FLE	SCS, DCQ					FLE	DCQ, SAR, SCS, VPD
d1.1	FSL	SCS, DCQ					FRR	DCQ, SAR, SCS, VPD
d1.1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d1.1							TXM	SCS
d1.1							RND	SCS
d1.1							TRC	DCQ, SCS
d1.1							TRW	DCQ, SCS
d1.2	BDM	ARN, SBP	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.2	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d1.2	FBS	SCS, DCQ					FBS	DCQ, SAR, SCS, VPD
d1.2	FHA	SCS, DCQ					FHA	DCQ, SAR, SCS, VPD
d1.2	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD
d1.2	FKX	SCS, DCQ					MWLFKX	SCS
d1.2	FLE	SCS, DCQ					FLE	DCQ, SAR, SCS, VPD
d1.2	FSL	SCS, DCQ					FRR	DCQ, SAR, SCS, VPD
d1.2	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d1.2							TXM	SCS
d1.2							RND	SCS
d1.2							TRC	DCQ, SCS
d1.2							TRW	DCQ, SCS
d1.3			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.3	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d1.3	FBS	SCS, DCQ	ARIFKX	SCS			FBS	DCQ, SAR, SCS, VPD
d1.3	FHA	SCS, DCQ	RND	SCS			FHA	DCQ, SAR, SCS, VPD
d1.3	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD
d1.3	FKX	SCS, DCQ					MWLFKX	SCS

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d1.3	FLE	SCS, DCO					FLE	DCO, SAR, SCS, VPD
d1.3	FSL	SCS, DCO					FRR	DCO, SAR, SCS, VPD
d1.3	MWLFKX	VSA					FSL	DCO, SAR, SCS, VPD
d1.3							TXM	SCS
d1.3							RND	SCS
d1.3							TRC	DCO, SCS
d1.3							TRW	DCO, SCS
d1.4	BDM	ARN, SBP	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.4	FBG	SCS, DCO	FKX	ARN, SAR, SCS,VRF			FBG	DCO, SAR, SCS, VPD
d1.4	FBS	SCS, DCO	ARIFKX	SCS			FBS	DCO, SAR, SCS, VPD
d1.4	FHA	SCS, DCO	RND	SCS			FHA	DCO, SAR, SCS, VPD
d1.4	FIN	SCS, DCO					FKX	DCO, SAR, SCS, VPD
d1.4	FKX	SCS, DCO					MWLFKX	SCS
d1.4	FLE	SCS, DCO					FLE	DCO, SAR, SCS, VPD
d1.4	FSL	SCS, DCO					FRR	DCO, SAR, SCS, VPD
d1.4	MWLFKX	VSA					FSL	DCO, SAR, SCS, VPD
d1.4							TXM	SCS
d1.4							RND	SCS
d1.4							TRC	DCO, SCS
d1.4							TRW	DCO, SCS
d1.5	BDM	ARN, SBP	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.5	FBG	SCS, DCO	FKX	ARN, SAR, SCS,VRF			FBG	DCO, SAR, SCS, VPD
d1.5	FBS	SCS, DCO					FBS	DCO, SAR, SCS, VPD
d1.5	FHA	SCS, DCO					FHA	DCO, SAR, SCS, VPD
d1.5	FIN	SCS, DCO					FKX	DCO, SAR, SCS, VPD
d1.5	FKX	SCS, DCO					MWLFKX	SCS
d1.5	FLE	SCS, DCO					FLE	DCO, SAR, SCS, VPD
d1.5	FSL	SCS, DCO					FRR	DCO, SAR, SCS, VPD
d1.5	MWLFKX	VSA					FSL	DCO, SAR, SCS, VPD
d1.5							TXM	SCS
d1.5							RND	SCS
d1.5							TRC	DCO, SCS
d1.5							TRW	DCO, SCS
d1.6			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d1.6	FBG	SCS, DCO	FKX	ARN, SAR, SCS,VRF			FBG	DCO, SAR, SCS, VPD
d1.6	FBS	SCS, DCO	ARIFKX	SCS			FBS	DCO, SAR, SCS, VPD

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d1.6	FHA	SCS, DCQ	RND	SCS			FHA	DCQ, SAR, SCS, VPD
d1.6	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD
d1.6	FKX	SCS, DCQ					MWLFKX	SCS
d1.6	FLE	SCS, DCQ					FLE	DCQ, SAR, SCS, VPD
d1.6	FSL	SCS, DCQ					FRR	DCQ, SAR, SCS, VPD
d1.6	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d1.6							TXM	SCS
d1.6							RND	SCS
d1.6							TRC	DCQ, SCS
d1.6							TRW	DCQ, SCS
d2								
d2.1	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d2.1	FBG	SCS	FKX	ARN, SAR, SCS,VRE			FBG	DCQ, SAR, SCS, VPD
d2.1	FBS	SCS					FBS	DCQ, SAR, SCS, VPD
d2.1	FHA	SCS					FHA	DCQ, SAR, SCS, VPD
d2.1	FIN	SCS					FKX	DCQ, SAR, SCS, VPD
d2.1	FKX	SCS					MWLFKX	SCS
d2.1	FLE	SCS					FLE	DCQ, SAR, SCS, VPD
d2.1	FSL	SCS					FRR	DCQ, SAR, SCS, VPD
d2.1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d2.1							TXM	SCS
d2.1							RND	SCS
d2.1							TRC	DCQ, SCS
d2.1							TRW	DCQ, SCS
d2.2			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d2.2	FBG	SCS	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d2.2	FBS	SCS					FBS	DCQ, SAR, SCS, VPD
d2.2	FHA	SCS					FHA	DCQ, SAR, SCS, VPD
d2.2	FIN	SCS					FKX	DCQ, SAR, SCS, VPD
d2.2	FKX	SCS					MWLFKX	SCS
d2.2	FLE	SCS					FLE	DCQ, SAR, SCS, VPD
d2.2	FSL	SCS					FRR	DCQ, SAR, SCS, VPD
d2.2	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d2.2							TXM	SCS
d2.2							RND	SCS
d2.2							TRC	DCQ, SCS
d2.2							TRW	DCQ, SCS

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d2.3	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d2.3	FBG	SCS	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d2.3	FBS	SCS					FBS	DCQ, SAR, SCS, VPD
d2.3	FHA	SCS					FHA	DCQ, SAR, SCS, VPD
d2.3	FIN	SCS					FKX	DCQ, SAR, SCS, VPD
d2.3	FKX	SCS					MWLFKX	SCS
d2.3	FLE	SCS					FLE	DCQ, SAR, SCS, VPD
d2.3	FSL	SCS					FRR	DCQ, SAR, SCS, VPD
d2.3	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d2.3							TXM	SCS
d2.3							RND	SCS
d2.3							TRC	DCQ, SCS
d2.3							TRW	DCQ, SCS
d2.4	BDM	SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d2.4	FBG	SCS					FBG	DCQ, SAR, SCS, VPD
d2.4	FBS	SCS					FBS	DCQ, SAR, SCS, VPD
d2.4	FHA	SCS					FHA	DCQ, SAR, SCS, VPD
d2.4	FIN	SCS					FKX	DCQ, SAR, SCS, VPD
d2.4	FKX	SCS					MWLFKX	SCS
d2.4	FLE	SCS					FLE	DCQ, SAR, SCS, VPD
d2.4	FSL	SCS					FRR	DCQ, SAR, SCS, VPD
d2.4	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d2.4							TXM	SCS
d2.4							RND	SCS
d2.4							TRC	DCQ, SCS
d2.4							TRW	DCQ, SCS
d2.5	BDM	SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d2.5	FBG	SCS					FBG	DCQ, SAR, SCS, VPD
d2.5	FBS	SCS					FBS	DCQ, SAR, SCS, VPD
d2.5	FHA	SCS					FHA	DCQ, SAR, SCS, VPD
d2.5	FIN	SCS					FKX	DCQ, SAR, SCS, VPD
d2.5	FKX	SCS					MWLFKX	SCS
d2.5	FLE	SCS					FLE	DCQ, SAR, SCS, VPD
d2.5	FSL	SCS					FRR	DCQ, SAR, SCS, VPD
d2.5	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d2.5							TXM	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d2.5							RND	SCS
d2.5							TRC	DCQ, SCS
d2.5							TRW	DCQ, SCS
d3								
d3.1	BDM	SDL			FKX	MGS,SAR,SCS,VRF	FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.1							FBG	DCQ, MTI, SAR, SCS, VPD
d3.1							FBS	DCQ, MTI, SAR, SCS, VPD
d3.1							FHA	DCQ, MTI, SAR, SCS, VPD
d3.1							FKX	DCQ, MTI, SAR, SCS, VPD
d3.1							MWLFKX	SCS
d3.1							FLE	DCQ, MTI, SAR, SCS, VPD
d3.1							FRR	DCQ, MTI, SAR, SCS, VPD
d3.1							FSL	DCQ, MTI, SAR, SCS, VPD
d3.1							TXM	SCS
d3.1							RND	SCS
d3.1							TRC	DCQ, SCS
d3.1							TRW	DCQ, SCS
d3.2	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.2			FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d3.2							FBS	DCQ, MTI, SAR, SCS, VPD
d3.2							FHA	DCQ, MTI, SAR, SCS, VPD
d3.2							FKX	DCQ, MTI, SAR, SCS, VPD
d3.2							MWLFKX	SCS
d3.2							FLE	DCQ, MTI, SAR, SCS, VPD
d3.2							FRR	DCQ, MTI, SAR, SCS, VPD
d3.2							FSL	DCQ, MTI, SAR, SCS, VPD
d3.2							TXM	SCS
d3.2							RND	SCS
d3.2							TRC	DCQ, SCS
d3.2							TRW	DCQ, SCS
d3.3	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.3			FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d3.3			FSL	ARN, SAR, SCS,VRF			FBS	DCQ, MTI, SAR, SCS, VPD
d3.3							FHA	DCQ, MTI, SAR, SCS, VPD
d3.3							FKX	DCQ, MTI, SAR, SCS, VPD
d3.3							MWLFKX	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d3.3							FLE	DCQ, MTI, SAR, SCS, VPD
d3.3							FRR	DCQ, MTI, SAR, SCS, VPD
d3.3							FSL	DCQ, MTI, SAR, SCS, VPD
d3.3							TXM	SCS
d3.3							RND	SCS
d3.3							TRC	DCQ, SCS
d3.3							TRW	DCQ, SCS
d3.4	BDM	SDL					FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.4							FBG	DCQ, MTI, SAR, SCS, VPD
d3.4							FBS	DCQ, MTI, SAR, SCS, VPD
d3.4							FHA	DCQ, MTI, SAR, SCS, VPD
d3.4							FKX	DCQ, MTI, SAR, SCS, VPD
d3.4							MWLFKX	SCS
d3.4							FLE	DCQ, MTI, SAR, SCS, VPD
d3.4							FRR	DCQ, MTI, SAR, SCS, VPD
d3.4							FSL	DCQ, MTI, SAR, SCS, VPD
d3.4							TXM	SCS
d3.4							RND	SCS
d3.4							TRC	DCQ, SCS
d3.4							TRW	DCQ, SCS
d3.5	BDM	SDL			FKX	MGS,SAR,SCS,VRF	FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.5							FBG	DCQ, MTI, SAR, SCS, VPD
d3.5							FBS	DCQ, MTI, SAR, SCS, VPD
d3.5							FHA	DCQ, MTI, SAR, SCS, VPD
d3.5							FKX	DCQ, MTI, SAR, SCS, VPD
d3.5							MWLFKX	SCS
d3.5							FLE	DCQ, MTI, SAR, SCS, VPD
d3.5							FRR	DCQ, MTI, SAR, SCS, VPD
d3.5							FSL	DCQ, MTI, SAR, SCS, VPD
d3.5							TXM	SCS
d3.5							RND	SCS
d3.5							TRC	DCQ, SCS
d3.5							TRW	DCQ, SCS
d3.6	BDM	SDL					FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.6							FBG	DCQ, MTI, SAR, SCS, VPD
d3.6							FBS	DCQ, MTI, SAR, SCS, VPD

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d3.6							FHA	DCQ, MTI, SAR, SCS, VPD
d3.6							FKX	DCQ, MTI, SAR, SCS, VPD
d3.6							MWLFKX	SCS
d3.6							FLE	DCQ, MTI, SAR, SCS, VPD
d3.6							FRR	DCQ, MTI, SAR, SCS, VPD
d3.6							FSL	DCQ, MTI, SAR, SCS, VPD
d3.6							TXM	SCS
d3.6							RND	SCS
d3.6							TRC	DCQ, SCS
d3.6							TRW	DCQ, SCS
d3.7	BDM	SDL			FKX	ARN, MGS	FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.7							FBG	DCQ, MTI, SAR, SCS, VPD
d3.7							FBS	DCQ, MTI, SAR, SCS, VPD
d3.7							FHA	DCQ, MTI, SAR, SCS, VPD
d3.7							FKX	DCQ, MTI, SAR, SCS, VPD
d3.7							MWLFKX	SCS
d3.7							FLE	DCQ, MTI, SAR, SCS, VPD
d3.7							FRR	DCQ, MTI, SAR, SCS, VPD
d3.7							FSL	DCQ, MTI, SAR, SCS, VPD
d3.7							TXM	SCS
d3.7							RND	SCS
d3.7							TRC	DCQ, SCS
d3.7							TRW	DCQ, SCS
d3.8	BDM	SDL					FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.8							FBG	DCQ, MTI, SAR, SCS, VPD
d3.8							FBS	DCQ, MTI, SAR, SCS, VPD
d3.8							FHA	DCQ, MTI, SAR, SCS, VPD
d3.8							FKX	DCQ, MTI, SAR, SCS, VPD
d3.8							MWLFKX	SCS
d3.8							FLE	DCQ, MTI, SAR, SCS, VPD
d3.8							FRR	DCQ, MTI, SAR, SCS, VPD
d3.8							FSL	DCQ, MTI, SAR, SCS, VPD
d3.8							TXM	SCS
d3.8							RND	SCS
d3.8							TRC	DCQ, SCS
d3.8							TRW	DCQ, SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d3.9	BDM	SDL	FBG	ARN, SAR, SCS, VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.9			FKX	ARN, SAR, SCS, VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d3.9							FBS	DCQ, MTI, SAR, SCS, VPD
d3.9							FHA	DCQ, MTI, SAR, SCS, VPD
d3.9							FKX	DCQ, MTI, SAR, SCS, VPD
d3.9							MWLFKX	SCS
d3.9							FLE	DCQ, MTI, SAR, SCS, VPD
d3.9							FRR	DCQ, MTI, SAR, SCS, VPD
d3.9							FSL	DCQ, MTI, SAR, SCS, VPD
d3.9							TXM	SCS
d3.9							RND	SCS
d3.9							TRC	DCQ, SCS
d3.9							TRW	DCQ, SCS
d3.10	BDM	SDL	FBG	ARN, SAR, SCS, VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d3.10			FKX	ARN, SAR, SCS, VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d3.10							FBS	DCQ, MTI, SAR, SCS, VPD
d3.10							FHA	DCQ, MTI, SAR, SCS, VPD
d3.10							FKX	DCQ, MTI, SAR, SCS, VPD
d3.10							MWLFKX	SCS
d3.10							FLE	DCQ, MTI, SAR, SCS, VPD
d3.10							FRR	DCQ, MTI, SAR, SCS, VPD
d3.10							FSL	DCQ, MTI, SAR, SCS, VPD
d3.10							TXM	SCS
d3.10							RND	SCS
d3.10							TRC	DCQ, SCS
d3.10							TRW	DCQ, SCS
d4								
d4.1	BDM	SDL	FBG	ARN, SAR, SCS, VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d4.1	FBG	SCS, DCQ	FKX	ARN, SAR, SCS, VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d4.1	FBS	SCS, DCQ					FBS	DCQ, MTI, SAR, SCS, VPD
d4.1	FHA	SCS, DCQ					FHA	DCQ, MTI, SAR, SCS, VPD
d4.1	FIN	SCS, DCQ					FKX	DCQ, MTI, SAR, SCS, VPD
d4.1	FKX	SCS, DCQ					MWLFKX	SCS
d4.1	FLE	SCS, DCQ					FLE	DCQ, MTI, SAR, SCS, VPD
d4.1	FSL	SCS, DCQ					FRR	DCQ, MTI, SAR, SCS, VPD
d4.1	MWLFKX	VSA					FSL	DCQ, MTI, SAR, SCS, VPD

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d4.1							TXM	SCS
d4.1							RND	SCS
d4.1							TRC	DCQ, SCS
d4.1							TRW	DCQ, SCS
d4.2	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d4.2	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d4.2	FBS	SCS, DCQ					FBS	DCQ, MTI, SAR, SCS, VPD
d4.2	FHA	SCS, DCQ					FHA	DCQ, MTI, SAR, SCS, VPD
d4.2	FIN	SCS, DCQ					FKX	DCQ, MTI, SAR, SCS, VPD
d4.2	FKX	SCS, DCQ					MWLFKX	SCS
d4.2	FLE	SCS, DCQ					FLE	DCQ, MTI, SAR, SCS, VPD
d4.2	FSL	SCS, DCQ					FRR	DCQ, MTI, SAR, SCS, VPD
d4.2	MWLFKX	VSA					FSL	DCQ, MTI, SAR, SCS, VPD
d4.2							TXM	SCS
d4.2							RND	SCS
d4.2							TRC	DCQ, SCS
d4.2							TRW	DCQ, SCS
d5								
d5.1			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d5.1	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d5.1	FBS	SCS, DCQ					FBS	DCQ, SAR, SCS, VPD
d5.1	FHA	SCS, DCQ					FHA	DCQ, SAR, SCS, VPD
d5.1	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD
d5.1	FKX	SCS, DCQ					MWLFKX	SCS
d5.1	FLE	SCS, DCQ					FLE	DCQ, SAR, SCS, VPD
d5.1	FSL	SCS, DCQ					FRR	DCQ, SAR, SCS, VPD
d5.1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
d5.1							TXM	SCS
d5.1							RND	SCS
d5.1							TRC	DCQ, SCS
d5.1							TRW	DCQ, SCS
d5.2			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d5.2	FBG	SCS, DCQ	FKX	ARN, SAR, SCS,VRF			FBG	DCQ, SAR, SCS, VPD
d5.2	FBS	SCS, DCQ					FBS	DCQ, SAR, SCS, VPD
d5.2	FHA	SCS, DCQ					FHA	DCQ, SAR, SCS, VPD
d5.2	FIN	SCS, DCQ					FKX	DCQ, SAR, SCS, VPD

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d5.2	FKX	SCS, DCO					MWLFKX	SCS
d5.2	FLE	SCS, DCO					FLE	DCO, SAR, SCS, VPD
d5.2	FSL	SCS, DCO					FRR	DCO, SAR, SCS, VPD
d5.2	MWLFKX	VSA					FSL	DCO, SAR, SCS, VPD
d5.2							TXM	SCS
d5.2							RND	SCS
d5.2							TRC	DCO, SCS
d5.2							TRW	DCO, SCS
d5.3			FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
d5.3	FBG	SCS, DCO	FKX	ARN, SAR, SCS,VRF			FBG	DCO, SAR, SCS, VPD
d5.3	FBS	SCS, DCO	RND	SCS			FBS	DCO, SAR, SCS, VPD
d5.3	FHA	SCS, DCO					FHA	DCO, SAR, SCS, VPD
d5.3	FIN	SCS, DCO					FKX	DCO, SAR, SCS, VPD
d5.3	FKX	SCS, DCO					MWLFKX	SCS
d5.3	FLE	SCS, DCO					FLE	DCO, SAR, SCS, VPD
d5.3	FSL	SCS, DCO					FRR	DCO, SAR, SCS, VPD
d5.3	MWLFKX	VSA					FSL	DCO, SAR, SCS, VPD
d5.3							TXM	SCS
d5.3							RND	SCS
d5.3							TRC	DCO, SCS
d5.3							TRW	DCO, SCS
d6								
d6.1	BDM	SDL					FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d6.1							FBG	DCO, MTI, SAR, SCS, VPD
d6.1							FBS	DCO, MTI, SAR, SCS, VPD
d6.1							FHA	DCO, MTI, SAR, SCS, VPD
d6.1							FKX	DCO, MTI, SAR, SCS, VPD
d6.1							MWLFKX	SCS
d6.1							FLE	DCO, MTI, SAR, SCS, VPD
d6.1							FRR	DCO, MTI, SAR, SCS, VPD
d6.1							FSL	DCO, MTI, SAR, SCS, VPD
d6.1							TXM	SCS
d6.1							RND	SCS
d6.1							TRC	DCO, SCS
d6.1							TRW	DCO, SCS
d6.2	BDM	SDL					FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
d8.2							FBG	DCQ, MTI, SAR, SCS, VPD
d8.2							FBS	DCQ, MTI, SAR, SCS, VPD
d8.2							FHA	DCQ, MTI, SAR, SCS, VPD
d8.2							FKX	DCQ, MTI, SAR, SCS, VPD
d8.2							MWLFKX	SCS
d8.2							FLE	DCQ, MTI, SAR, SCS, VPD
d8.2							FRR	DCQ, MTI, SAR, SCS, VPD
d8.2							FSL	DCQ, MTI, SAR, SCS, VPD
d8.2							TXM	SCS
d8.2							RND	SCS
d8.2							TRC	DCQ, SCS
d8.2							TRW	DCQ, SCS
d7								
d7.1	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d7.1			FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d7.1							FBS	DCQ, MTI, SAR, SCS, VPD
d7.1							FHA	DCQ, MTI, SAR, SCS, VPD
d7.1							FKX	DCQ, MTI, SAR, SCS, VPD
d7.1							MWLFKX	SCS
d7.1							FLE	DCQ, MTI, SAR, SCS, VPD
d7.1							FRR	DCQ, MTI, SAR, SCS, VPD
d7.1							FSL	DCQ, MTI, SAR, SCS, VPD
d7.1							TXM	SCS
d7.1							RND	SCS
d7.1							TRC	DCQ, SCS
d7.1							TRW	DCQ, SCS
d8								
d8.1	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
d8.1			FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
d8.1							FBS	DCQ, MTI, SAR, SCS, VPD
d8.1							FHA	DCQ, MTI, SAR, SCS, VPD
d8.1							FKX	DCQ, MTI, SAR, SCS, VPD
d8.1							MWLFKX	SCS
d8.1							FLE	DCQ, MTI, SAR, SCS, VPD
d8.1							FRR	DCQ, MTI, SAR, SCS, VPD
d8.1							FSL	DCQ, MTI, SAR, SCS, VPD
d8.1							TXM	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
10.1							RND	SCS
10.1							TRC	DCQ, SCS
10.1							TRW	DCQ, SCS
10.2	BDM	SDL	FBG	ARN, SAR, SCS,VRF			FIN	ARF, ARN, MGS, MTI, NHD, NOC, VNA, VRF
10.2			FKX	ARN, SAR, SCS,VRF			FBG	DCQ, MTI, SAR, SCS, VPD
10.2							FBS	DCQ, MTI, SAR, SCS, VPD
10.2							FHA	DCQ, MTI, SAR, SCS, VPD
10.2							FKX	DCQ, MTI, SAR, SCS, VPD
10.2							MWLFKX	SCS
10.2							FLE	DCQ, MTI, SAR, SCS, VPD
10.2							FRR	DCQ, MTI, SAR, SCS, VPD
10.2							FSL	DCQ, MTI, SAR, SCS, VPD
10.2							TXM	SCS
10.2							RND	SCS
10.2							TRC	DCQ, SCS
10.2							TRW	DCQ, SCS
11								
11.1	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
11.1	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
11.1							FBS	DCQ, SAR, SCS, VPD
11.1							FHA	DCQ, SAR, SCS, VPD
11.1							FKX	DCQ, SAR, SCS, VPD
11.1							MWLFKX	SCS
11.1							FLE	DCQ, SAR, SCS, VPD
11.1							FRR	DCQ, SAR, SCS, VPD
11.1							FSL	DCQ, SAR, SCS, VPD
11.1							TXM	SCS
11.1							RND	SCS
11.1							TRC	DCQ, SCS
11.1							TRW	DCQ, SCS
11.2	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
11.2	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
11.2							FBS	DCQ, SAR, SCS, VPD
11.2							FHA	DCQ, SAR, SCS, VPD
11.2							FKX	DCQ, SAR, SCS, VPD
11.2							MWLFKX	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
11.2							FLE	DCQ, SAR, SCS, VPD
11.2							FRR	DCQ, SAR, SCS, VPD
11.2							FSL	DCQ, SAR, SCS, VPD
11.2							TXM	SCS
11.2							RND	SCS
11.2							TRC	DCQ, SCS
11.2							TRW	DCQ, SCS
11.3	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
11.3	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
11.3							FBS	DCQ, SAR, SCS, VPD
11.3							FHA	DCQ, SAR, SCS, VPD
11.3							FKX	DCQ, SAR, SCS, VPD
11.3							MWLFKX	SCS
11.3							FLE	DCQ, SAR, SCS, VPD
11.3							FRR	DCQ, SAR, SCS, VPD
11.3							FSL	DCQ, SAR, SCS, VPD
11.3							TXM	SCS
11.3							RND	SCS
11.3							TRC	DCQ, SCS
11.3							TRW	DCQ, SCS
11.4	ARIFKX	DCQ, SCS, DST						
11.4	MWL	VSA						
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
11.4								
12								
12.1	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.1	MWL	VSA					FBG	DCQ, SAR, SCS, VPD

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
12.1							FBS	DCQ, SAR, SCS, VPD
12.1							FHA	DCQ, SAR, SCS, VPD
12.1							FKX	DCQ, SAR, SCS, VPD
12.1							MWLFKX	SCS
12.1							FLE	DCQ, SAR, SCS, VPD
12.1							FRR	DCQ, SAR, SCS, VPD
12.1							FSL	DCQ, SAR, SCS, VPD
12.1							TXM	SCS
12.1							RND	SCS
12.1							TRC	DCQ, SCS
12.1							TRW	DCQ, SCS
12.2	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.2	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
12.2							FBS	DCQ, SAR, SCS, VPD
12.2							FHA	DCQ, SAR, SCS, VPD
12.2							FKX	DCQ, SAR, SCS, VPD
12.2							MWLFKX	SCS
12.2							FLE	DCQ, SAR, SCS, VPD
12.2							FRR	DCQ, SAR, SCS, VPD
12.2							FSL	DCQ, SAR, SCS, VPD
12.2							TXM	SCS
12.2							RND	SCS
12.2							TRC	DCQ, SCS
12.2							TRW	DCQ, SCS
12.3	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.3	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
12.3							FBS	DCQ, SAR, SCS, VPD
12.3							FHA	DCQ, SAR, SCS, VPD
12.3							FKX	DCQ, SAR, SCS, VPD
12.3							MWLFKX	SCS
12.3							FLE	DCQ, SAR, SCS, VPD
12.3							FRR	DCQ, SAR, SCS, VPD
12.3							FSL	DCQ, SAR, SCS, VPD
12.3							TXM	SCS
12.3							RND	SCS
12.3							TRC	DCQ, SCS
12.3							TRW	DCQ, SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
12.4	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.4	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
12.4							FBS	DCQ, SAR, SCS, VPD
12.4							FHA	DCQ, SAR, SCS, VPD
12.4							FKX	DCQ, SAR, SCS, VPD
12.4							MWLFKX	SCS
12.4							FLE	DCQ, SAR, SCS, VPD
12.4							FRR	DCQ, SAR, SCS, VPD
12.4							FSL	DCQ, SAR, SCS, VPD
12.4							TXM	SCS
12.4							RND	SCS
12.4							TRC	DCQ, SCS
12.4							TRW	DCQ, SCS
12.5	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.5	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
12.5							FBS	DCQ, SAR, SCS, VPD
12.5							FHA	DCQ, SAR, SCS, VPD
12.5							FKX	DCQ, SAR, SCS, VPD
12.5							MWLFKX	SCS
12.5							FLE	DCQ, SAR, SCS, VPD
12.5							FRR	DCQ, SAR, SCS, VPD
12.5							FSL	DCQ, SAR, SCS, VPD
12.5							TXM	SCS
12.5							RND	SCS
12.5							TRC	DCQ, SCS
12.5							TRW	DCQ, SCS
12.6	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.6	MWL	VSA					FBG	DCQ, SAR, SCS, VPD
12.6							FBS	DCQ, SAR, SCS, VPD
12.6							FHA	DCQ, SAR, SCS, VPD
12.6							FKX	DCQ, SAR, SCS, VPD
12.6							MWLFKX	SCS
12.6							FLE	DCQ, SAR, SCS, VPD
12.6							FRR	DCQ, SAR, SCS, VPD
12.6							FSL	DCQ, SAR, SCS, VPD
12.6							TXM	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
12.8							RND	SCS
12.6							TRC	DCQ, SCS
12.6							TRW	DCQ, SCS
13								
13.1	ARIFKX	SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
13.1							FBG	DCQ, SAR, SCS, VPD
13.1							FBS	DCQ, SAR, SCS, VPD
13.1							FHA	DCQ, SAR, SCS, VPD
13.1							FKX	DCQ, SAR, SCS, VPD
13.1							MWLFKX	SCS
13.1							FLE	DCQ, SAR, SCS, VPD
13.1							FRR	DCQ, SAR, SCS, VPD
13.1							FSL	DCQ, SAR, SCS, VPD
13.1							TXM	SCS
13.1							RND	SCS
13.1							TRC	DCQ, SCS
13.1							TRW	DCQ, SCS
13.2	ARIFKX	SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
13.2							FBG	DCQ, SAR, SCS, VPD
13.2							FBS	DCQ, SAR, SCS, VPD
13.2							FHA	DCQ, SAR, SCS, VPD
13.2							FKX	DCQ, SAR, SCS, VPD
13.2							MWLFKX	SCS
13.2							FLE	DCQ, SAR, SCS, VPD
13.2							FRR	DCQ, SAR, SCS, VPD
13.2							FSL	DCQ, SAR, SCS, VPD
13.2							TXM	SCS
13.2							RND	SCS
13.2							TRC	DCQ, SCS
13.2							TRW	DCQ, SCS
13.3	ARIFKX	DCQ, SCS, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
13.3							FBG	DCQ, SAR, SCS, VPD
13.3							FBS	DCQ, SAR, SCS, VPD
13.3							FHA	DCQ, SAR, SCS, VPD
13.3							FKX	DCQ, SAR, SCS, VPD
13.3							MWLFKX	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
13.3							FLE	DCQ, SAR, SCS, VPD
13.3							FRR	DCQ, SAR, SCS, VPD
13.3							FSL	DCQ, SAR, SCS, VPD
13.3							TXM	SCS
13.3							RND	SCS
13.3							TRC	DCQ, SCS
13.3							TRW	DCQ, SCS
13.4	ARIFKX	DCQ, SCS					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
13.4							FBG	DCQ, SAR, SCS, VPD
13.4							FBS	DCQ, SAR, SCS, VPD
13.4							FHA	DCQ, SAR, SCS, VPD
13.4							FKX	DCQ, SAR, SCS, VPD
13.4							MWLFKX	SCS
13.4							FLE	DCQ, SAR, SCS, VPD
13.4							FRR	DCQ, SAR, SCS, VPD
13.4							FSL	DCQ, SAR, SCS, VPD
13.4							TXM	SCS
13.4							RND	SCS
13.4							TRC	DCQ, SCS
13.4							TRW	DCQ, SCS
14								
11							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
11							FBG	DCQ, SAR, SCS, VPD
11							FBS	DCQ, SAR, SCS, VPD
11							FHA	DCQ, SAR, SCS, VPD
11							FKX	DCQ, SAR, SCS, VPD
11							MWLFKX	SCS
11							FLE	DCQ, SAR, SCS, VPD
11							FRR	DCQ, SAR, SCS, VPD
11							FSL	DCQ, SAR, SCS, VPD
11							TXM	SCS
11							RND	SCS
11							TRC	DCQ, SCS
11							TRW	DCQ, SCS
12								
12.1	BDM	ARN, SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
12.1	RND	SCS					FBG	DCQ, SAR, SCS, VPD
12.1	ARIFKX	SCS					FBS	DCQ, SAR, SCS, VPD
12.1							FHA	DCQ, SAR, SCS, VPD
12.1							FKX	DCQ, SAR, SCS, VPD
12.1							MWLFKX	SCS
12.1							FLE	DCQ, SAR, SCS, VPD
12.1							FRR	DCQ, SAR, SCS, VPD
12.1							FSL	DCQ, SAR, SCS, VPD
12.1							TXM	SCS
12.1							RND	SCS
12.1							TRC	DCQ, SCS
12.1							TRW	DCQ, SCS
12.2							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
12.2	FBG	DCQ, SCS					FBG	DCQ, SAR, SCS, VPD
12.2	FBS	DCQ, SCS					FBS	DCQ, SAR, SCS, VPD
12.2	FHA	DCQ, SCS					FHA	DCQ, SAR, SCS, VPD
12.2	FIN	DCQ, SCS					FKX	DCQ, SAR, SCS, VPD
12.2	FKX	DCQ, SCS					MWLFKX	SCS
12.2	FLE	DCQ, SCS					FLE	DCQ, SAR, SCS, VPD
12.2	FRR	DCQ, SCS					FRR	DCQ, SAR, SCS, VPD
12.2	FSL	DCQ, SCS					FSL	DCQ, SAR, SCS, VPD
12.2	RND	SCS					TXM	SCS
12.2	ARIFKX	SCS					RND	SCS
12.2							TRC	DCQ, SCS
12.2							TRW	DCQ, SCS
13	ARIFKX	SCS					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
13							FBG	DCQ, SAR, SCS, VPD
13							FBS	DCQ, SAR, SCS, VPD
13							FHA	DCQ, SAR, SCS, VPD
13							FKX	DCQ, SAR, SCS, VPD
13							MWLFKX	SCS
13							FLE	DCQ, SAR, SCS, VPD
13							FRR	DCQ, SAR, SCS, VPD
13							FSL	DCQ, SAR, SCS, VPD
13							TXM	SCS
13							RND	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
13							TRC	DCQ, SCS
13							TRW	DCQ, SCS
14	ARIFKX	SCS					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
14							FBG	DCQ, SAR, SCS, VPD
14							FBS	DCQ, SAR, SCS, VPD
14							FHA	DCQ, SAR, SCS, VPD
14							FKX	DCQ, SAR, SCS, VPD
14							MWLFKX	SCS
14							FLE	DCQ, SAR, SCS, VPD
14							FRR	DCQ, SAR, SCS, VPD
14							FSL	DCQ, SAR, SCS, VPD
14							TXM	SCS
14							RND	SCS
14							TRC	DCQ, SCS
14							TRW	DCQ, SCS
15								
15.1							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.1	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.1	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.1	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.1	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.1	FKX	DCQ,SCS					MWLFKX	SCS
15.1	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.1	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.1							TXM	SCS
15.1							RND	SCS
15.1							TRC	DCQ, SCS
15.1							TRW	DCQ, SCS
15.2	BDM	ARN, SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.2	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.2	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.2	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.2	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.2	FKX	DCQ,SCS					MWLFKX	SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
15.2	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.2	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.2	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.2							TXM	SCS
15.2							RND	SCS
15.2							TRC	DCQ, SCS
15.2							TRW	DCQ, SCS
15.3							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.3	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.3	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.3	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.3	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.3	FKX	DCQ,SCS					MWLFKX	SCS
15.3	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.3	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.3	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.3							TXM	SCS
15.3							RND	SCS
15.3							TRC	DCQ, SCS
15.3							TRW	DCQ, SCS
15.4							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.4	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.4	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.4	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.4	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.4	FKX	DCQ,SCS					MWLFKX	SCS
15.4	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.4	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.4	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.4							TXM	SCS
15.4							RND	SCS
15.4							TRC	DCQ, SCS
15.4							TRW	DCQ, SCS
15.5							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.5	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.5	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
15.5	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.5	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.5	FKX	DCQ,SCS					MWLFKX	SCS
15.5	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.5	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.5	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.5							TXM	SCS
15.5							RND	SCS
15.5							TRC	DCQ, SCS
15.5							TRW	DCQ, SCS
15.6							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.6	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.6	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.6	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.6	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.6	FKX	DCQ,SCS					MWLFKX	SCS
15.6	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.6	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.6	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.6							TXM	SCS
15.6							RND	SCS
15.6							TRC	DCQ, SCS
15.6							TRW	DCQ, SCS
15.7							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.7	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.7	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.7	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.7	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.7	FKX	DCQ,SCS					MWLFKX	SCS
15.7	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.7	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.7	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.7							TXM	SCS
15.7							RND	SCS
15.7							TRC	DCQ, SCS
15.7							TRW	DCQ, SCS

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
15.8							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.8	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.8	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.8	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.8	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.8	FKX	DCQ,SCS					MWLFKX	SCS
15.8	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.8	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.8	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.8							TXM	SCS
15.8							RND	SCS
15.8							TRC	DCQ, SCS
15.8							TRW	DCQ, SCS
15.9	BDM	SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
15.9	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
15.9	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
15.9	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
15.9	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
15.9	FKX	DCQ,SCS					MWLFKX	SCS
15.9	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
15.9	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
15.9	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
15.9							TXM	SCS
15.9							RND	SCS
15.9							TRC	DCQ, SCS
15.9							TRW	DCQ, SCS
15.10								
15.10	FBG	DCQ,SCS						
15.10	FBS	DCQ,SCS						
15.10	FHA	DCQ,SCS						
15.10	FIN	DCQ,SCS						
15.10	FKX	DCQ,SCS						
15.10	FLE	DCQ,SCS						
15.10	FSL	DCQ,SCS						
15.10	MWLFKX	VSA						
15.10								

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ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
15.10								
15.10								
15.10								
16							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
16	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
16	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
16	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
16	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
16	FKX	DCQ,SCS					MWLFKX	SCS
16	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
16	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
16	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
16							TXM	SCS
16							RND	SCS
16							TRC	DCQ, SCS
16							TRW	DCQ, SCS
17	BDM	SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
17	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
17	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
17	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
17	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
17	FKX	DCQ,SCS					MWLFKX	SCS
17	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
17	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
17	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
17							TXM	SCS
17							RND	SCS
17							TRC	DCQ, SCS
17							TRW	DCQ, SCS
e1							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
e1	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
e1	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
e1	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
e1	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
e1	FKX	DCQ,SCS					MWLFKX	SCS
e1	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
e1	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
e1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
e1							TXM	SCS
e1							RND	SCS
e1							TRC	DCQ, SCS
e1							TRW	DCQ, SCS
e2							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
e2	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
e2	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
e2	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
e2	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
e2	FKX	DCQ,SCS					MWLFKX	SCS
e2	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
e2	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
e2	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
e2							TXM	SCS
e2							RND	SCS
e2							TRC	DCQ, SCS
e2							TRW	DCQ, SCS
e3							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
e3	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
e3	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
e3	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
e3	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
e3	FKX	DCQ,SCS					MWLFKX	SCS
e3	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
e3	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
e3	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
e3							TXM	SCS
e3							RND	SCS
e3							TRC	DCQ, SCS
e3							TRW	DCQ, SCS
m1	BDM	SDL					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
m1	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
m1	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
m1	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
m1	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
m1	FKX	DCQ,SCS					MWLFKX	SCS
m1	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
m1	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
m1	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
m1							TXM	SCS
m1							RND	SCS
m1							TRC	DCQ, SCS
m1							TRW	DCQ, SCS
m2							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
m2	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
m2	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
m2	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
m2	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
m2	FKX	DCQ,SCS					MWLFKX	SCS
m2	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
m2	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
m2	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
m2							TXM	SCS
m2							RND	SCS
m.'							TRC	DCQ, SCS
m2							TRW	DCQ, SCS
m3							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
m3	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
m3	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
m3	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
m3	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
m3	FKX	DCQ,SCS					MWLFKX	SCS
m3	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
m3	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
m3	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
m3							TXM	SCS
m3							RND	SCS
m3							TRC	DCQ, SCS
m3							TRW	DCQ, SCS
s1	ARIFKX	DCQ, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
s1							FBG	DCQ, SAR, SCS, VPD
s1							FBS	DCQ, SAR, SCS, VPD
s1							FHA	DCQ, SAR, SCS, VPD
s1							FKX	DCQ, SAR, SCS, VPD
s1							MWLFKX	SCS
s1							FLE	DCQ, SAR, SCS, VPD
s1							FRR	DCQ, SAR, SCS, VPD
s1							FSL	DCQ, SAR, SCS, VPD
s1							TXM	SCS
s1							RND	SCS
s1							TRC	DCQ, SCS
s1							TRW	DCQ, SCS
s2	ARIFKX	DCQ, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s2							FBG	DCQ, SAR, SCS, VPD
s2							FBS	DCQ, SAR, SCS, VPD
s2							FHA	DCQ, SAR, SCS, VPD
s2							FKX	DCQ, SAR, SCS, VPD
s2							MWLFKX	SCS
s2							FLE	DCQ, SAR, SCS, VPD
s2							FRR	DCQ, SAR, SCS, VPD
s2							FSL	DCQ, SAR, SCS, VPD
s2							TXM	SCS
s2							RND	SCS
s2							TRC	DCQ, SCS
s2							TRW	DCQ, SCS
s3	ARIFKX	DCQ, DST					FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s3							FBG	DCQ, SAR, SCS, VPD
s3							FBS	DCQ, SAR, SCS, VPD
s3							FHA	DCQ, SAR, SCS, VPD
s3							FKX	DCQ, SAR, SCS, VPD
s3							MWLFKX	SCS
s3							FLE	DCQ, SAR, SCS, VPD
s3							FRR	DCQ, SAR, SCS, VPD
s3							FSL	DCQ, SAR, SCS, VPD
s3							TXM	SCS
s3							RND	SCS
s3							TRC	DCQ, SCS

APPENDIX C
ISSUE EVENT COLLECTION CROSSWALK
AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
s3							TRW	DCQ, SCS
s4							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s4	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
s4	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
s4	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
s4	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
s4	FKX	DCQ,SCS					MWLFKX	SCS
s4	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
s4	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
s4	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
s4							TXM	SCS
s4							RND	SCS
s4							TRC	DCQ, SCS
s4							TRW	DCQ, SCS
s5							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s5	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
s5	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
s5	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
s5	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
s5	FKX	DCQ,SCS					MWLFKX	SCS
s5	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
s5	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
s5	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
s5							TXM	SCS
s5							RND	SCS
s5							TRC	DCQ, SCS
s5							TRW	DCQ, SCS
s6							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s6	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
s6	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
s6	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
s6	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
s6	FKX	DCQ,SCS					MWLFKX	SCS
s6	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
s6	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
s6	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD

APPENDIX C

ISSUE EVENT COLLECTION CROSSWALK

AS OF 1 DEC 93

ISSUE MOP	ADVANCED WARFARE DEMONSTRATION		PLATOON EXTERNAL EVALUATIONS		TASK FORCE GUNNERY		NTC ROTATION 94-07	
s6							TXM	SCS
s6							RND	SCS
s6							TRC	DCQ, SCS
s6							TRW	DCQ, SCS
s7							FIN	ARF, ARN, MGS, NHD, NOC, VNA, VRF
s7	FBG	DCQ,SCS					FBG	DCQ, SAR, SCS, VPD
s7	FBS	DCQ,SCS					FBS	DCQ, SAR, SCS, VPD
s7	FHA	DCQ,SCS					FHA	DCQ, SAR, SCS, VPD
s7	FIN	DCQ,SCS					FKX	DCQ, SAR, SCS, VPD
s7	FKX	DCQ,SCS					MWLFKX	SCS
s7	FLE	DCQ,SCS					FLE	DCQ, SAR, SCS, VPD
s7	FSL	DCQ,SCS					FRR	DCQ, SAR, SCS, VPD
s7	MWLFKX	VSA					FSL	DCQ, SAR, SCS, VPD
s7							TXM	SCS
s7							RND	SCS
s7							TRC	DCQ, SCS
s7							TRW	DCQ, SCS

As of 1 DEC 93

APPENDIX D

POINTS OF CONTACT

INDIVIDUAL	PHONE	FAX
COL EBERLEE, BATTLE CMD BL	552-3323	552-2842
COL HAWKINS, FT BLISS	978-7611	978-2530
COL HUBBARD, BLIT-D	680-4283	(804)727-2947
COL KERR, FT SILL	639-5647	(405)351-4802
COL MOLER, TSM AGS	464-7955	
COL WILLIAMS, FT LEE	687-1808	(804)862-4829
LTC THURMAN, TEXCOM	738-1286	738-1475
LTC TUHILL, NTC OPERATIONS	470-5667	
MAJ BOEGLEN, 16TH CAV	464-2309	
MAJ CHAMBERLAIN, DWBL, FT BENNING	835-1816/4922	835-3841
MAJ CRAFT, ARI-POM		
MAJ FINK, 194TH BDE	464-6766	464-7485
MAJ HENSON (JOHN), AVIATION BL	558-2110/3485	558-2916
MAJ HRDY (RUSS), DCD, USAARMC	464-1250	464-7126
MAJ LANDERS, DCD, USAARMC	464-1909	464-7126
MAJ MORTENSEN, INTEL CTR	879-2373	879-7692
MAJ STULL (ROBERT), ADA LAB	978-4265/7611	978-2530
MAJ WILLIAMSON, SIGNAL CTR	780-3769	780-8346
MAJ WILSON, MWBL	464-2399	
CPT BRANSCOM, DCD, USAARMC	464-1347	464-7126
CPT CLARK (SCOTT), BLITD	680-4472	680-2974
CPT JEDDRYCH, CSS BL (SACIMS)	687-0012	

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CPT LEWLEY, TF 1-70	464-3853	
CPT SINKLER, DCD, ENG CTR	(314)563-7359	563-4089
CPT SMALLS, DWBL	835-4922/1482	835-1816
DR BLACK, ARI-KNOX	464-6928/3450	464-8113
DR GROSSMAN (JON), RAND CORP	(310)393-0411 ext 7622	(310)393-4818
MR COURTWRIGHT, BDM FEDERAL	(505)848-5546	
MS DRAKE (KATHY), HQ TRAC	552-5511	552-4368
MR MONDAY, LORAL	(502)942-1092	
MR MCCARTNEY (PAT), D&SABL, FT SILL	639-5647	(405)351-5028
MR MCCOOL (BRYSON), TRAC-WSMR	258-6016	258-5104
MR PAYAN (FERNIE), TRAC-WSMR	258-2406	258-5104
MS TISDALE (SARAH), HQ TRAC	552-5511	552-4368
MR WALSH (BILL), ARI-POM	(408)372-3329	

APPENDIX E
RESOURCE REQUIREMENTS
AS OF 1 DEC 93

	EVENTS			
AGENCY	DECEMBER 1-18, 1993 ADVANCED WARFARE DEMONSTRATION	JANUARY 10-20, 1994 PLATOON EXTERNAL EVALUATIONS	FEBRUARY 7-23, 1994 TASK FORCE GUNNERY	APRIL 3-23, 1994 NTC ROTATION 94-07
FORT BENNING	1 O-3 CO/TM SME, 1 E-7 MTR PLT SME	2 O-3 PLT SME	2 E-7 BRADLEY MASTER GUNNERS	1 O-3 CO/TM SME, 3 O-3 PLT SME, 1 E-7 MTR PLT SME FOR TF 1-70; 2 O-3 CO/TM SME FOR TF 2-18, 1 O-3 FOR TAF
FORT BLISS	1 O-3 ADA PLT SME			1 O-3 ADA PLT SME FOR TF 1-70; 1 O-3 ADA PLT SME FOR TF 2-18
FORT HUACHUA	1 O-3 BDE SME			1 O-3 TF SME, 1 O-3 BDE SME FOR TF 1-70; 1 O-3 TF SME FOR TF 2-18
FORT IRWIN				10 M998, ALL VIDEOTAPED 94-07 AARS, AERIAL VIDEOTAPED RAW FOOTAGE, AUDIO RECORDING OF SPECIFIED RADIO NETS, VIDEO SUPPORT FOR POST ROTATION DEBRIEFS, NTC HYPERBATTLE PLAYBACKS, MILES/TWGSS INFORMATION, LIVE FIRE WRITTEN RESULTS, O/C COMMENTS
FORT KNOX	1 O-3 CO/TM SME, 1 E-7 SCT PLT SME, 1 O-3 TF SME, 1 O-3 MED SME, 1 O-3 TM STRIKE SME	4 O-3 PLT SME, 2 O-3 CO SME	2 O-3 SME, 2 E-7 MASTER GUNNERS	1 O-4 BDE SME, 2 O-3 TF SME, 3 O-3 CO/TM SME, 8 O-3 PLT SME, 1 MED PLT SME, 1 O-3 SCT PLT SME FOR 1-70; 1 O-3 TF SME, 2 O-3 CO/TM SME, 4 O-3 PLT SME, 1 MED PLT SME, 1 O-3 SCT PLT SME FOR 2-18, 2 O-3 FOR TAF

APPENDIX E
RESOURCE REQUIREMENTS
AS OF 1 DEC 93

AGENCY	DECEMBER 1-19, 1993 ADVANCED WARFARE DEMONSTRATION	JANUARY 10-20, 1994 PLATOON EXTERNAL EVALUATIONS	FEBRUARY 7-23, 1994 TASK FORCE GUNNERY	APRIL 3-23, 1994 NTC ROTATION 94-07
FORT LEE	1 0-3 TF SME			1 0-3 TF SME FOR 1-70; 1 0-3 TF SME FOR 2-18
FORT LEONARDWOOD	1 0-3 EN CO SME			1 0-3 EN CO SME FOR TF 1-70; 1 0-3 EN CO SME FOR 2-18
FORT RUCKER				2 0-3 AVN BDE SME
FORT SILL	1 0-3 BTY SME	1 0-3 BTY SME		2 0-3 SME FOR PALADIN BTY
RAND	1 SME			1 SME FOR TACTICAL ANALYSIS FEEDBACK CENTER
TRAC				

APPENDIX E
RESOURCE REQUIREMENTS
AS OF 1 DEC 93

AGENCY	DECEMBER 1-19, 1993 ADVANCED WARFARE DEMONSTRATION	JANUARY 10-20, 1994 PLATOON EXTERNAL EVALUATIONS	FEBRUARY 7-23, 1994 TASK FORCE GUNNERY	APRIL 3-23, 1994 NTC ROTATION 94-07
TRAC-WSMR				
OPTEC				
MWBL FORT KNOX	1 O-4 BATTLE CMD SME			1 O-5 OIC FOR ENTIRE OPERATION

B-1

Task Force-level Defensive Scenario Materials

Section B-1 contains the following materials:

Manned Unit Starting Locations
Manned Simulator and Friendly SAFOR Platoon Starting Locations
Minefield and Artillery Positions
Enemy SAFOR Locations and Target Vehicles (TRPs)
Combat Elements Starting Locations
Combat Support Elements Starting Locations
Task Force OPORD

APPENDIX B

SCENARIO MATERIALS

Appendix B contains the following sections:

Unit Starting Positions (TF DEF)

A CO	1st PLT	(M1)	NK 321194
	2d PLT	(M1)	NK 324187
	3d PLT	(BFV)	NK 321181
	CO HQ		NK 318197
	TNS		NK 293116
B CO	2d PLT	(M1)	NK 292175
	1st PLT	(M1)	NK 292185
	3d PLT	(BFV)	NK 282170
	CO HQ		NK 287180
	TNS		NK 258177
D CO	Same as B CO		
C CO	1st PLT	(M1)	NK269202
	3rd PLT	(M1)	NK274207
	CO HQ		NK270208
	TNS		NK252215
TM STRIKE	A SECT		NK357192
	B Sect		NK362189

Situation for 7 NOV Reference

Manned Simulators

			AZ
	B66	NK 348197	3600
Attach 3 M1 SAFOR PLT →	B11	NK 345199	3600
Attach 3 M1 Safor PLT →	B21	NK 347195	3600
Attach 3 BFV Safor PLT →	B31	NK 352199	3600

Friendly Automated Platoons.

Type	# veh	Bump No.	Location	AZ	Gunnery Level	OPEN	FORM
M1	4	A11	NK 320194	1600	NOV	2000	Wdg
M1	4	A21	NK 322187	1600			
M1	4	A31	NK 315180	1600			
M1	4	C11	NK 272207	2400			
M1	4	C21	NK 265203	2400			
M1	4	S11	NK 355193	4000			
BFV	4	S21	NK 365190	4000			

7 NOV DEF

Minefields

100m deep; 1 mine per meter

	From	To
1	NK347187	NK357185
2	NK332183	NK332173
3	NK325195	NK335198

Arty

			AZ	Ammo
Battery	#1	NK 240 200	1600	900 HE/PD, 96 RAAM
	#2	NK 240 210	"	"
	#3	NK 240 220	"	"

[redacted]

Enemy SAFOR

Type	#	LOC	AZ	GUN	OPEN	FORM
T72	3	NK 36Ø15Ø	47ØØ	NOV	2000	COL
BMP	1Ø	NK 37Ø15Ø	43ØØ	NOV	2000	COL
T72	3	NK 37Ø145	48ØØ	"	"	"
T72	1Ø	NK 39Ø 15Ø	"	"	"	"
BMP	1Ø	NK 40Ø 15Ø	"	"	"	"
BMP	1Ø	NK 40Ø155	"	"	"	"
BMP	1Ø	NK 40Ø145	"	"	"	"
T72	1Ø	NK 42Ø 15Ø	"	"	"	"
BMP	31	NK 43Ø 15Ø	"	"	"	"
BMP	31	NK 43Ø145	"	"	"	"

Target Vehicles (TRPs)

1. NK 34917Ø
2. NK 338173
3. NK 323182
4. NK 35Ø19Ø

RED ARTY

TF 1-10 OPORD #　　　DTG Ø1 123Ø APR 93　　　COPY　　　OF

ENEMY: (GENERAL) 2nd echelon regiment from 14 MRD attacks through Central Corridor to secure Barstow Rd and Brown/Debnam Pass.

TF ENEMY: we expect 1x MRR from 14 GMRD. I expect enemy to attack with 3 MRB (120 BMP, 31 T72) and regimental recon and arty assets.

HIGHER MISSION: 194 SAB occupies and defends in sector NLT 020900 APR 93 to destroy the 14th GMRD. On order, assists forward passage of 1st CAV DIV and 1st CAV DIV. [illegible] (AA)

HIGHER INTENT: [illegible] recon/CTR recon fight [illegible] destroy 1st ECH [illegible] of PL [illegible]. [illegible] to complete destruction of 2nd ECH [illegible] FWD of TF's defensive in depth. No pen beyond PL Bowling Green [illegible] initiative to conduct counterattack at [illegible] terrain. End state: destruction of 14th GMRD and ready to pass [illegible] forward passage.

TASK ORG	TM A (-) 1-30		TM B 1-70		TM C (-) 1-70		TM D 15		TM [illegible] 1-70		TF CONTROL	
	1/A/1-70 4/A/1-70		1/B/1-70 3/B/1-70 2/D/15		1/C/1-70 3/C/1-70		1/D/1-70 2/B/1-70 3/A/1-70		2/C/1-70 [illegible] 3/D/15 3/[illegible]/[illegible] [illegible] 2/2/[illegible] ([illegible]) 1/[illegible] 2/[illegible]		[illegible] [illegible] SCT/1-70	

ATTACH/DETACH: EFF 011200 APR 93

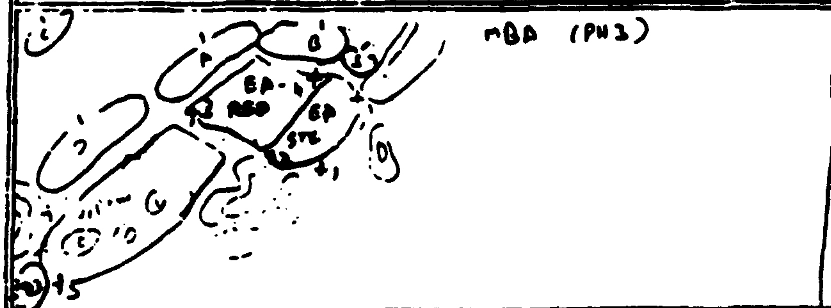
TF MISSION: TF 1-70 AR defends in sector from [illegible] to [illegible] to [illegible] to complete destruction of 2nd echelon regiment and allow no penetration of PL Bowling Green.

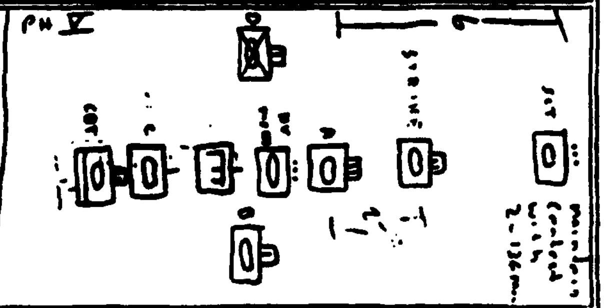
INTENT/CONCEPT: The purpose of this mission is to complete destruction of the 2nd echelon of the 14th GMRD in our sector and allow no penetration of PL Bowling Green. We will finish this mission with [illegible] combat power of 3 [illegible] abreast on [illegible] ready to pass 1st CAV DIV and on [illegible] and follow and support their attack. [illegible] combat power to deny penetration of PL Bowling Green. We will fight this battle reverse slope 3 [illegible] on line with main effort in [illegible]. Secondary in Black and Yellow. [illegible] in reserve accept risk in Colorado Wash.

PIR:
1. Where is div recon and rgt recon effort?
2. Where are 14th GMRD 2nd echelon regiments?
3. Will enemy employ chemical weapons?

ACTION/ UNIT	1 Prepare DZ∅	2 Fight forward of MBA	3 MBA fight	4 Cont to EA Grey	5 Follow and Support	
STRIKE (1)	Occupy BP T1, T2, T3 Site & cover obst 1001 Leave lanes clear	Defend T1, T2 Force enemy to deploy (main effort)	Hide vic T1, T2 Defend T3 to deny penetration along [illegible]		STANDARD TF DIAMOND SEE SKETCH	
A (-)	Occupy BP A Site & cover obst 1002		Defend BP A Orient TRP 2-4			
B	Occupy BP B Site & cover obst 1003 Leave lanes clear		(main effort) Defend BP B Orient TRP 2-3	Occupy BP B2 Orient on enemy		
C	Occupy BP C Recon Alt Pos in BP A, B, D		Defend BP C (Reserve)			
D	Occupy BP D Site & cover obst 1004-1009		Defend BP D Orient TRP 2-5	Occupy BP D2 Orient on enemy		
B/19 EN	Emplace obstacles in following priority: 1002, 1003, 1001 1008, 1004-1008	Occupy BP E	Defend BP E Deny penetration along Colorado wadi			
SCTS	Occupy OP 1-4	Report enemy movement to passes				
PRIORITY OF FIRES	FA: SCTS MORT: D →	FA: STRIKE	FA 1. B 2. A 3. D	FA: B	FA: [illegible] M: A	
PRIORITY OF ADA SPT	ADA Priority to DZ∅, CBT TNS (1 Section)					
PRIORITY OF EN SPT	CMOB, SURV, MOB Blade Priority to BP B, A, D, B2, STRIKE in that order →				MOB, CMOB, SURV	

ADA Yellow light | MOPP II | OEG Moderate risk | STD TO 0455





CDR TM B	S3 TM D	MAIN NJ 245213	A/J 4804 SWITCH TIME 0920
PYRO	CHALLENGE/PASSWORD		OFFICIAL

Annex B to OPORD 4
References:

DTG [illegible]

Echelon	Ph I	Ph II	Ph III	Ph IV	Ph V
IRT	Locate on high ground Collect intel	→	→	→	→
Recon (4BMP/4BRDM)	Rgt - ID routes for rgt main body. Detect obstacles. Div - Recon routes, collect intel on our positions,				
1	Maneuver to AA	Attacking through Central Corridor	Attack through Debnam Pass	Continue attack to Crash Hill	Consolidate on OBJ Red
2	Maneuver to AA	Attacking through Central Corridor	Platoons on line approx 1000 m from Blue defensive area.	↓	↓
3	Maneuver to AA	Attacking through Central Corridor	3d MRB will reinforce success of MRB 1, 2.	↓ Repel Blue CATK	↓
Arty		Intensive arty prep	Support Attack		

Air Threat: RED 6 HIND 6 HIP 6 HOPLITE 4 sorties Fixed Wing

NBC Threat: YELLOW Agents: Persistent Delivery Means: Arty, Helo

Intel/EW: GSR colocate w/Scts. Collect per R+S Plan.

PIR: (1) Recon (2) 2d echelon elements (3) use of chemicals IR:

Intel Tasking: Per R+S Plan

EPW/Equip: EPW Collection Point BSA. Captured Documents to S2.

Documents/Equip Required: None

Counterintel: N/A

Reports: Intel Update 15 minutes before mission start.
Green 2 due to TF S2 at 0600/1800 daily.

Hi: 75 Lo: 42 Precip: 0 Winds: SW/7 knots Vis: Unl Humidity: 90%

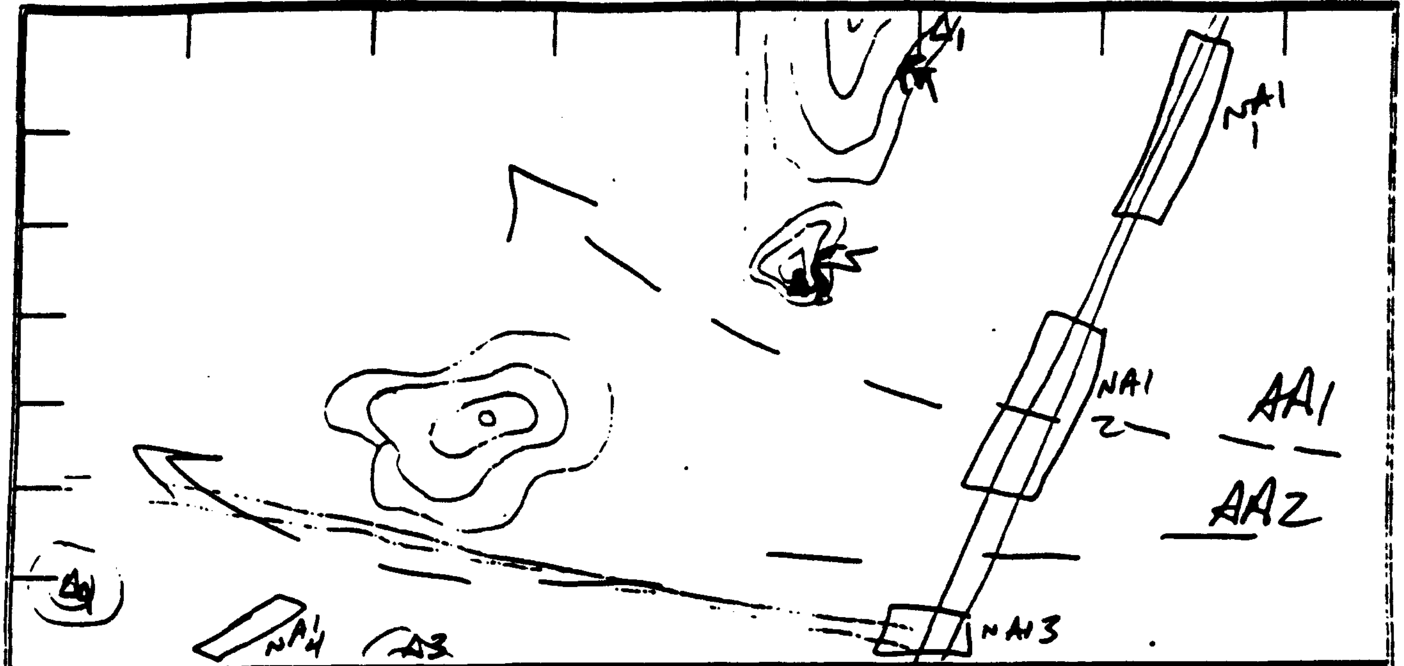
	BMNT	SR	SS	EENT	MR	MS	%ILLUM	NVG ON	NVG OFF
1 Apr	0535	0700	1849	1935	2100	0500	10	–	–
2 Apr	0537	0701	1850	1937	2101	0502	15	–	–

Remarks: None

Appendix: 1 R+S Plan

OFFICIAL: [signature]

Appendix _1_ (TF 1-?? ies Plan) to OPORD 93- DTG 011200Apr93
References:



Point NAI | Area NAI | Ground Avenue | Mob Cor
Air Avenue | OP/LP | GSR | LZ/DZ

PRI	NAI LOCATION	START STOP	SPECIFIC INFO. REQUIREMENTS	A	B	C	D	G	A 7	S C	M T	G S			COORDINATION	REPORTS, SPECIAL INSTRUCTIONS
1	2 NK3917	0001/2400	ID Rkt Recon							X		X			None	BN O/I
2	3 NK3314	0001/2400	ID 1st ech BN							X					None	BN O/I
3	1 NK3424	0001/2400	ID 1st ech BN							X		X			None	BN O/I
4	4 NK3113	0001/2400	ID 2nd ech BN							X					None	BN O/I

ANNEX C TO OPORD ________

FIRE SUPPORT EXECUTION MATRIX

UNIT	DRT CRP	FSE/AGMB	Main Fight	Counter		
SCT/Strike	W1H FOF FA →	W1H %	W1H			
A						
B		% FOFFA →	WH 2011 →			
C	W1H FIST detached	W1H — —	W1H — —			
D	W2H FOF Mortar	W2H — —	W2H — —	FPF-M →		
FA	C FIST Attached E-Sort... Fill →			→		

WH 2000	377141		WH 2009	1114?	(W2H)
WH 2001	?70171		WH 2010	?5?1??	
WH 2002	??7203		WH 201?	[illegible]	
WH 2003	36?177				
WH 2004	3531??	(W1H)			
WH 2005	35615	(W1H)			
WH 2006	3731?	(W1H)			
WH 2007	321150	(W2H)			
WH 2008	31314?	(W2H)			

CDR's INTENT: Destroy enemy w/ Indirect forward of IV line in conjunction w/ [illegible] fire

FPFs: FA A Co.
MTRs D Co.

PRI TGTs: FA SCT. W1H % B WH2011
MTRs D W2H % D, FPF

FSCOORD Measures: CFL PL Louisville, % PL Bowling Green

REMARKS: 1-201 FA DS
1-41 FA R

B-2

Task Force-level Attack Scenario Materials

Section B-2 contains the following materials:

Manned Unit Starting Locations
Manned Simulator and Friendly SAFOR Platoon Starting Locations
Minefield and Artillery Positions
Enemy SAFOR Locations and Target Vehicles (TRPs)
Combat Elements Starting Locations
Combat Support Elements Starting Locations
Task Force OPORD

Unit Starting Positions CO/TM SIMEX ATK

TF Attack

TM A	1st PLT (M1)	NK 423 930	Column
	2d PLT (M1)	NK 420 930	Column
	3d PLT (BFV)	NK 421 926	Column
	CO HQ	NK 418 928	
	TNS	NK 414 924	

TM B Same as TM A

TM D	1st	NK 410 923	(M1)
	2nd	NK 408 918	(M1)
	3d	NK 407 924	(BFV)
	CO HQ	NK 404 920	
	TNS	NK 398 916	

TM C	1st	NK 410 938	(M1)
	2d	NK 402 932	(M1)
	HQ	NK 404 934	
	TNS	NK 392 928	

STRIKE	A Sect	NK 443 952
	B Sect	NK 456 944

situation #2
TF Deliberate Attack

Manned Simulators

1. CDR

	B66	NJ410925
	B11	NJ 407923
	B21	NJ 404921
	B31	NJ 402919

SAFOR

M1 PLT behind B11 - column
M1 PLT behind B21 - column
BFV PLT behind B31 - Column

Friendly
A'nal Elements take commands from SAFOR operator

Type	# VEH	BUMP NO	LOCATION	AZ	GUN LEVEL	OPEN RANGE	FORM
M1	11	~~[illegible]~~ A123	NJ476985	1600	NOV	2000	LINE
M1	11	B123	NJ453987	4800	NOV	2000	LINE
M1	4	S11	NJ 442958	1000	NOV	2000	COL
M1	4	S21	NJ450945	1000	NOV	"	"
M1	14	D66	NJ 420945	"	"	"	"
M1	14	A66	NJ 420929	"	"	"	"
M1	10	C66	NJ410937	"	"	"	"

Minefields - All 100m deep / 1 mine per meter

	From	To
1.	NK558038	NK562Ø39
2.	NK564038	NK567Ø39
3.	NK570Ø38	NK571Ø35
4.	NK572Ø33	NK572Ø3Ø
5	NK573Ø28	NK573Ø25

Artillery

			AZ	Ammo
Battery	# 1	NJ 475 977	1000	800 HE/PD, 96 RAAM
	# 2	NJ 476 972	1000	"
	# 3	NJ 482 968	1000	"
MORTAR		NJ 415 94Ø	1000	528 HE/PD

ENEMY SAFOR

TYPE	# VEH	LOCATION	AZ	GUN	OPEN	FORM
BMP	3	NK573045	3400	NOV	2000	LINE
BMP	4	NK579040	4000	NOV	2000	LINE
BMP	3	NK578029	5600	NOV	2000	LINE
T72	7	NK574046	3400	"	"	"
T72	1	NK580041	4000	"	"	"
~~T72~~	~~1~~	~~NK5750~~				
T72	1	NK579028	5600	"	"	"
BMP	2	NK556029	4000	"	"	"

~~Target vehicles (checkpoint)~~

APP 3 T72 NK 595 060 4300

10 T72

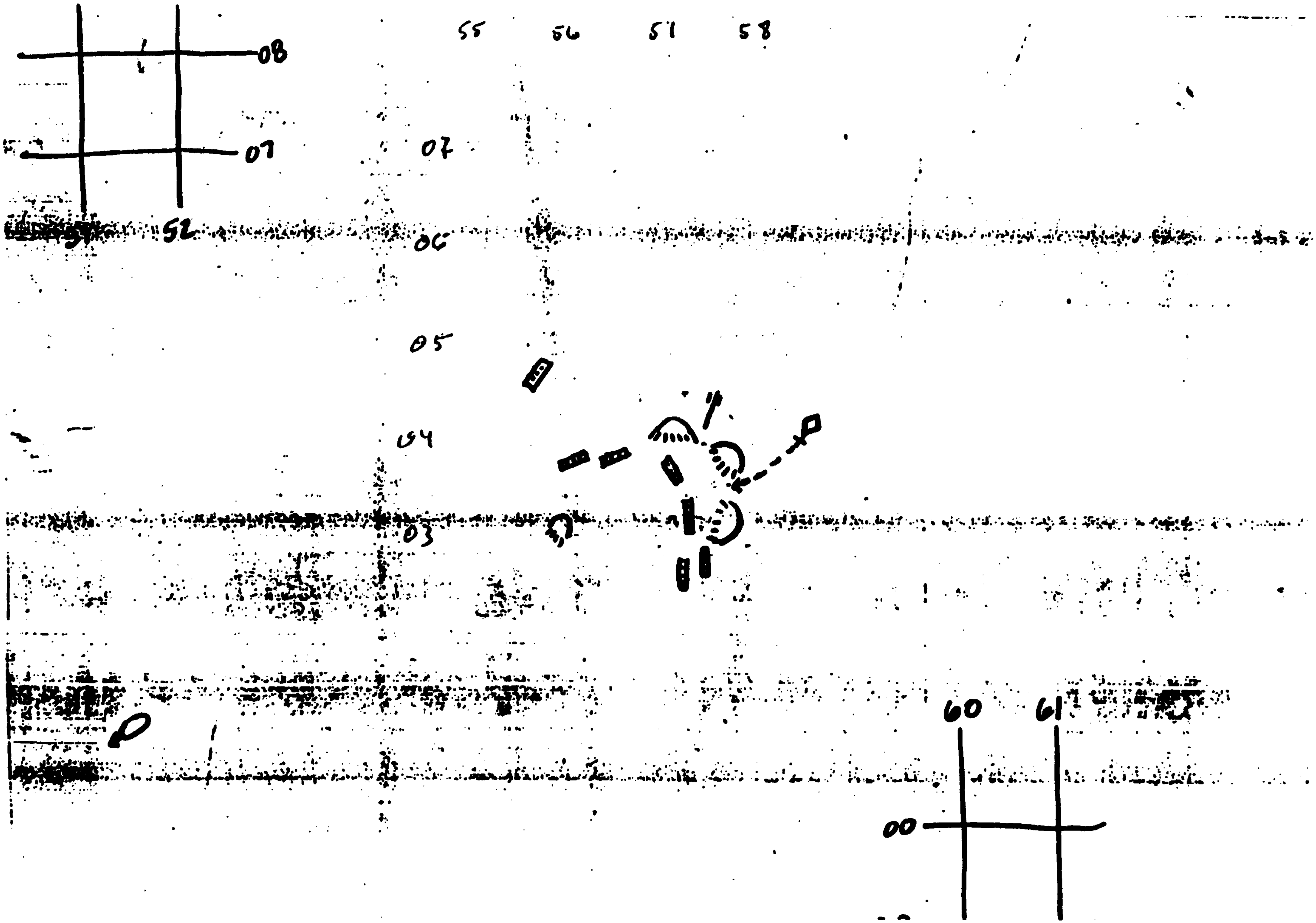
CSOP { 1 T72 NK 558029
3 BMP NK 556029

MRC+ { 3 BMP NK 573045
1 T72 NK 572047
3 BMP NK 579040
1 T72 NK 578042
3 BMP NK 578030

C/ATK – 6 T72 NK 570070

Recon – 2 BMP NJ 520990

MRC(+) Defense



TF 1-70 OPORD # 93-13 DTG 171700 APR 93 COPY 1 OF

ENEMY: (GENERAL) 16CAA main attack halted. 194 is opposed by 2d echelon regiments of 36 MRD and 14 MRD currently in hasty defensive positions. Enemy still maintains a CATK force of one Tank Regiment.

TF ENEMY: TF 1-70 is opposed by remnants of 18MRR. Expect a MRC+ in a hasty defense vic Whale Gap and a MRC+ in hasty defense vic Red Pass. AT-5's are probably deployed to the flanks on high ground. LD is within arty range and expect a CSOP (3 BMP) 1-3 km from main defense. Strength is 85%. NBC use is likely.

HIGHER MISSION: 194th SAB attacks NLT 190700 APR to seize OBJ Achilles; o/o assists forward passage of 101st ABD + 1st CAV DIV

HIGHER INTENT: The key to our success, and the corps success, is the destruction of the enemy at the Whale Gap + Red Pass. TFs who are not the main effort must quickly reinforce or assume the attacks on these two areas if called to do so. ATK Helos are available to mass firepower - use them. Once on OBJ NIKE, we must be able to reorganize quickly to defeat a certain TR CATK. Our end state will be 2 TF controlling the passes on OBJ Achilles, one TF controlling Whale Gap, 1 TF in reserve

TASK ORG	A 1-70		B 1-70		C 1-70		D 1/15		TM STK		TF Con
ADA Pl	1 A/1-70	ADB	1 B/1-70	ADC	1 C/1-70	ADD1	1 D/15	ADE1	2 C/1-70		HV MORT
ADA 21	2 A/1-70	ADB2	2 B/1-70	ADC2	3 C/1-70	ADD2	3 A/1-70		D/15		SCT
ADA 31	3 D/15 (-)	ADB3	2 D/15		3 CTOR	ADD3	3 A/1-70		1 3/10		GSR
	1 CTOR		1 B/19				2 B/19		2 3/10		B 19 (-)
			2 CTOR								

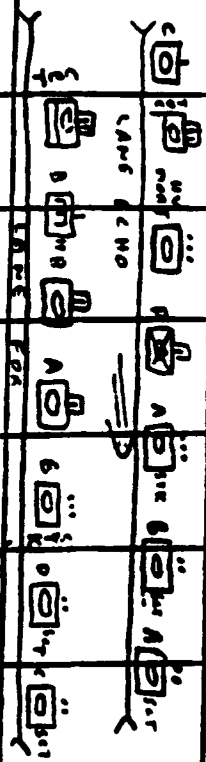
ATTACH/DETACH: 4 CTOR

TF MISSION: TF 1-70 AR, 194th SAB follows TF 3-123 NLT 070700 APR and if necessary assumes their mission to seize OBJ HANCOCK (NJ4698), then continues attack along AXIS Stuart to seize OBJ Grant (NL5703) for passage of follow-on units. O/O assists passage of 101st ABD and 1st CAV DIV continuing the corps attack to OBJ NIKE.

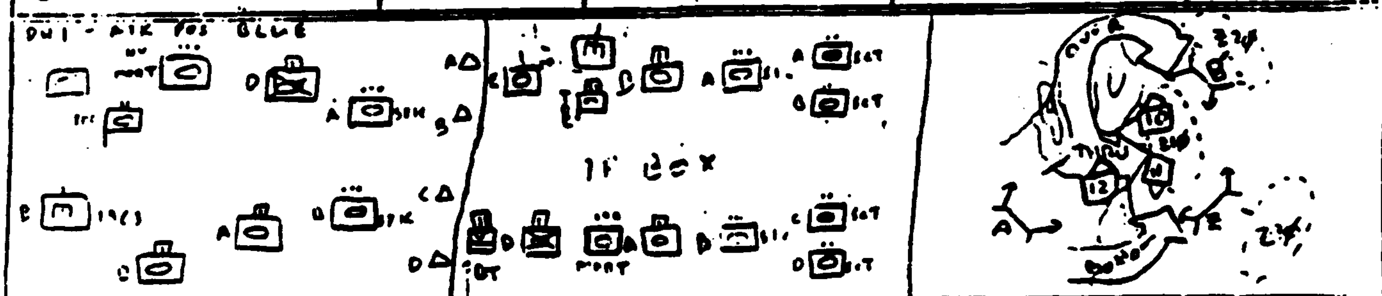
INTENT/CONCEPT: Conduct the follow + support mission with the SCTs forward + TM STK tucked tight in behind 3-123. Conduct a rapid passage of transition to the main attack. Scouts and strike kicking out to conduct advance guard operations. TM A will move to a SBF position. TM B will push along AXIS TOP dismounted and send vehicles along AXIS OVER and unhinge key enemy positions north of the pass facilitating the remainder of the TF forcing through the pass. Success equals taking objective Grant to facilitate the movement of the Corps follow-on forces with 50% combat power remaining.

PIR:

1. Where are AT-5's located? On flanks, high ground?
2. Is the CATK force an armor, mech, or AT unit?
3. Will the enemy employ NBC weapons in Whale Gap and/or Red Pass?

	I	II	III	IV		V
ACTION/ UNIT	Occupy ATK Pos BLUE	Forward passage of lines	Follow + Assume	Attack COA 1 (Axis OVER)	Attack COA 2 (Axis Thru)	Prep for catk/ Assist ff
TM A	SEE SKETCH		staggered TF Box - see sketch; lead TM	A Then seize 12		-21ø
TM B				Attack along over to 8	Lead Along THRU seize 10	-22ø
TM C				Follow TM D on THRU to seize 11	Follow TM D. Seize 12	Forward 12
TM D				Lead THRU to seize 10	Follow TM B THRU seize 11	-23ø
STC				A/STK Recon Axis OVER; B/STK Recon Axis Bottom		33ø
SCT			Recon each column for TF	A+B Recon Axis TOP; C+D Recon Axis Bottom		Occupy OP 1-4
A/G						Mark + clear Red Pass Pd. Man
PRIORITY OF FIRES		FA: SCT M: D	FA: SCT M: D			
~~PRIORITY OF ADA SPT~~	Notes			Alternate COA if non-standing to in south	Primary COA	Priority pass lane is Red Pass. Secondary is Axis Over or Bottom.
PRIORITY OF ENGR	MOB, CMOB, S					Mob/Cmob.

ADA	MOPP	OEG	STD TO	



CDR Follows 2nd unit along Axis	S3 Axis Bottom - TM B; Axis Over - TM D	MAIN Follow MOST; In PH 4 set; In PL 5 set A	A/J; SWITCH TIME

PYRO	CHALLENGE/PASSWORD	OFFICIAL

TF 1-70 OPORD/FRAGO MATRIX# [illegible] DTG: [illegible] COPY 1 OF 1

CONCEPT OF SERVICE SUPPORT Fuel Resupply by LOGPAC from CTCP (CL III, V). Normal resupply using LOGPACs from BSA.

Manning Arming Fueling Fixing Transportation Protection of Sustainment

CSS Execution Matrix

Phase	FWD AID STATION	CBT TNS	UMCP	
Call Sign	COBRA RAMPAGE	COBRA TRAINS	COBRA WRENCH	
Task Org	SOP	SOP	SOP	
I	ATK POSN	→	→	
II - III	Behind C	→	→	
IV	CP 7	K10	K10	
V	↓	L2	L2	

Class I & Water: C, C, C / resupply @ LOGPAC

Class V	CSR per Day			Effective 18 Apr 93	
120 mm APDS	25	4.2 in HE	40	.50 CAL	600
120 mm HEAT	15	4.2 in ILLUM	6	7.62 mm	600
TOW	8	4.2 in SMK	10	5.56 mm SAW	600
25mm AP	100	DRAGON	8	5.56 mm	200
25mm HE	100	AT 4	6	155 HE	70
STINGER	6	155 ILLUM	8	155 DPICM	30

Class VII Priority: FIST-V, CFV, M1

Class IX: FIST-V, CFV M1 | BDE MSP

FIELD TRAINS LOCATION: TBD

Maintenance Priorities

Tracks	M981	M2	M1	M88	
Wheels	M978	M1097	M984		
Unit	STK	A	D	B	C

LOGPAC

Date	Ration Cycle	LRP	Time	Window
17 Apr	C, C, A	1	0600	2 hours
↓	↓	1	1900	↓
18 Apr	C, C, C	3	0600	↓
↓	↓	3	1800	↓

CSS Support Matrix (Satellite)

Unit	CL 1,3,5	MED EVAC	RECOVERY	
Scout	1/ACT D / 2/ACT A	→	→	
Mortar	C	→	→	
ADA	ATTCH TM	→	→	
ENG	B	→	→	
TOC	C	→	→	

Civil-Military Ops.:

MSR

Name: Time Effective:

TBD

Priority Movement Along MSR: CBT Veh Fuel, MEDEVAC Rtw, Cit Resupply Fuel.

Notes:

SPECIAL INSTRUCTIONS

	BDE	TF	
Water Point	BSA	Thru LOGPAC	
GREGG	BSA	↓	
KIA	BSA	↓	
AXP	TBD	At BAS	
Air Medevac	Ø	Ø	
EPW Coll.	BSA	Thru LOGPAC	

CSS Check Points

LRP	GRID	LRP	GRID
1	NJ230453		
2	NJ470985		
3	NK562024		
4	NJ368942		

DECON

Templated Agent	Linkup Site	Decon Site	Dirty Route
VX	LRP 2		
GB	LRP 2		

B-3

Task Force-level Movement to Contact Scenario Materials

Section B-3 contains the following materials:

Manned Unit Starting Locations
Manned Simulator and Friendly SAFOR Platoon Starting Locations
Minefield and Artillery Positions
Enemy SAFOR Locations and Target Vehicles (TRPs)
Combat Elements Starting Locations
Combat Support Elements Starting Locations
Task Force OPORD

Unit starting positions CO/TM SIMEX MTC

Movement to contact

TM A	1st PLT (M1)	NK575145	
	2nd PLT (M1)	NK575139	
	3rd PLT (BFV)	NK582147	(Bumper no's 3d PLT D)
	CO HQ	NK580140	
	TNS	NK540130	(No ammo)
TM D	1st PLT (M1)	NK558108	
	2d PLT (M1)	NK563109	(Bumper no's 3d PLT A co)
	3d PLT (BFV)	NK559100	(Bumper no's 3d PLT D co)
	CO HQ	NK564104	
	TNS	NK572098	(No ammo)
TM B	Same as TM D.		
TM C	1st PLT (M1)	NK595097	column
	3d PLT (M1)	NK 601090	column
	CO HQ	NK519092	
	TNS	NK609084	

TM STRIKE A Sect (2 M1 [C23, C24], 1 ITV [D41], Bradly [H66], FSO [H67]) NK530117
B Sect (2M1 [C21, C22], 1ITV [D42]) NK553154
(Bumper no's 2d PLT C CO)

TF CDR follows evaluated CO/TM.
No ammo in all trains elements

Movement to Contact

Enemy SAFOR

Type	#	LOC	AZ	GUN	OPEN	FORM
BMP	4	NK380200	1600	NOV	2000	COL
T72	3	NK300200	"	"	"	"
BMP	10	NK295200	"	"	"	"
T72	10	NK250200	"	"	"	"
BMP	10	NK240200	"	"	"	"
BMP	10	NK230200	"	"	"	"
BMP	10	NK220200	"	"	"	"

Give TO Mr. Rick Lozicki in MWTB.

CRP	3 BMP	NK300200
	3 BMP	NK305205
EP	3 BMP	NK270200
FSE	3 T72	NK240200
	~~3~~ 6 BMP	NK245200
AG	3 T72, 10 BMP	NK200200
	3 T72, 10 BMP	NK205205

Move To Contact

BLUFOR

Bump NO	TYPE	LOC	AZ	Fuel	Ammo
B21	M1A2	NK 589108	5600	Full	Full
B22	M1	NK 590107	"		
B24 ↖Tether	M1	NK 591106	"		
B23	M1	NK 592105	"		
B66	M1A2	NK 593104	"		
B11	M1A2	NK 589106	"		
B12	M1	NK 590105	"		
B14 ↖Tether	M1	NK 591104	"		
B13	M1	NK 592103	"		
~~B65~~	~~M1~~	~~NK 593102~~	~~"~~		
B31	M1A2	NK591108	"		
B32	M1	NK592107	"		
B34 ↖Tether	M1	NK593106	"		
B33	M1	NK594105	"		
~~B40(FSO)~~	~~M1~~	~~NK595104~~	"		

ARTY

	LOC	AZ	Ammo
Battery #1	NK523105	4800	300 HE/PD, 96 RAAM
#2	NK523100	"	"
#3	NK523095	"	"
Mortars	NK570100	5600	528 HE/PD

TF 1-70 OPORD # 93-10-10 DTG COPY OF

ENEMY: (GENERAL)
The 14th GMRD is expected to resume the offensive within the next 24 hours. They are likely to lead their attack with a FOD to seize Red Lake Pass and then pass through the SF basin to secure their southern flank.

TF ENEMY: unidentified MRB(s) of the 32d MRR will attack as the forward detachment they will attack through the central corridor with a CRP (4 BMP-1 / 1 T-72), FSE (10/3) and Main Body (31/10). Their mission will be to seize Red Lake pass and passes through Siberia. They are likely to use chemical munitions to secure their flanks. They will have a RAG supporting.

HIGHER MISSION:
3/24 ID (M) attacks ________ to seize OBJ TIGER (NK2520) to deny the lead Regiment of the 14th GMRD access to the central corridor.

HIGHER INTENT: The purpose of our mission is to quickly seal Brown Debnam Pass the block central corridor via Crash Hill to deny access to the 32d MRR of 14 GMRD. We will finish with TF 1-70 on OBJ cobra in Hasty Def and 2 TFs on obj TIGER in hasty Def. TF 1-70 will lead to destroy FOD, and if possible seize OBJ Cobra. TF 2-18 and TF 4-69 will pass forward to seize OBJ Tiger.

TASK ORG	A	B	C (-)	D	STK	TF CONT
1-70	1 A	1 B	1 C	1 D	2 C	SCT
	2 A	2 B	3 C	3 A	2 D	MORT
	3 D	2 D		3 B		

ATTACH/DETACH:

TF MISSION: TF 1-70 AR conducts movement to contact at ________ to destroy FOD of 14th GMRD and seize OBJ COBRA (NK3516) to allow forward passage of TF 2-18 and TF 4-69 to seize OBJ Tiger.

INTENT/CONCEPT: The purpose of this mission is to destroy the FOD and seize Brown-Debnam Pass to allow forward passage of follow-on TF's. Our end state will be the destruction of the FOD and 3 CO/TM's defending along PL Blue, ready to pass follow on forces. The battle hand over line is PL BLUE. We will move through the central corridor in a TF V. TM STK must destroy the CRP. TM A or D (whichever makes 1st contact) must destroy the FSE. The remaining CO/TMs will execute TF Battle drill to catch main body in pre-planned EA if possible.

PIR:
1. will main body hug North wall or southern wall?

ACTION/ UNIT	1 LD	2 PL RED	3 PL RED TO PL WHITE	4 PL white	5 Seize OBJ Cobra	6 Pass Follow on Forces
STK	1 A1 → A9; 2 D1 → D4	Find + Destroy CRP Report FSE	→	→	Clear 27 Screen TF South Flank	S1Ø
A	Move A1 → A4	O/O occupy EA CAT 13	O/O occupy EA LION 18	O/O set EA WHALE 19; O/O set EA BEAR 21	Clear AND A5 Lane 2	A1Ø
B	Move Center of corridor 3-5 km Behind A+D	O/O set 12 EA FOX; O/O set EA CAT 15	O/O set EA LION 17; O/O set 20 EA Shark	O/O set EA WHALE 21; O/O set EA BEAR 26	Clear B1 + B2 LANE 2	B1Ø
C	Follow TM B	O/O set 11 EA FOX; O/O set EA CAT 14	O/O set EA WHALE 18; O/O set 23 EA Shark	O/O set EA WHALE 28; O/O set D4 (RES)	Set D4 (RES)	C1Ø (RES)
D	MOVE D1 → D4	O/O occupy EA FOX 10	O/O occupy EA SHARK 22	O/O set EA BEAR 25	Clear AND D5 LANE 1	D1Ø
SCT	Observe Beyond PL Red	Observe Along PL white	Observe into Brown Debonn Poss	Observe along PL Blue	Observe Beyond PL Blue	Observe OBJ TIGER
PRIORITY OF FIRES	TM STK; MO: TM D →	O/O Unit in contact w/ FSE	O/O Unit in contact with main body. →	→	TM D, B, A →	→
PRIORITY OF ADA SPT	TM D →					
PRIORITY OF EN SPT						

ADA Yellow Tight	MOPP Ø	OEG 70 CGY	STD TO

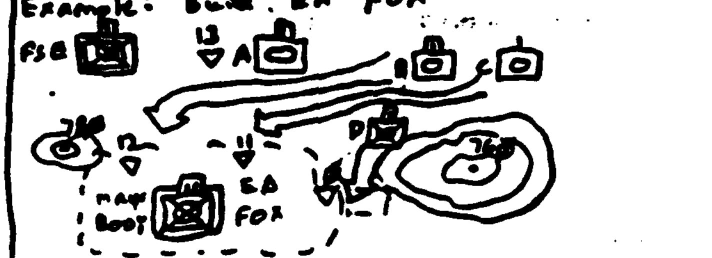
TF Y

1 STK A

⊢3-5 km⊣ 3 km ⊣ B C(-)

2 STK D

Example: Build EA FOR



CDR TM D	S3 TM A	MAIN Follow TM C. set upon contact with CRP.	A/J
			SWITCH TIME

PYRO	CHALLENGE/PASSWORD	OFFICIAL

Annex B to OPORD ________ DTG ____________
References:

Echelon					
	Recons FD route of march; clears route. CRP				
	FSE Provides security for AG. Protects force. Tries to move unhindered.				
	AG - Attempts to move unhindered to FD Objective.				
	TF Angel - Air Assaults to secure key terrain overlooking Red Pass - approx 100 dismounts w/ AT-5.				
	MRR - Attacks east through Central Corridor to secure MRD objective				

Air Threat: Yellow _6_ HIND _6_ HIP _6_ HOPLITE _Ø_ Fixed Wing

NBC Threat: Yellow Agents: Non Persis Delivery Means: Air, Arty

Intel/EW: N/A

PIR: N/A IR: N/A

Intel Tasking: N/A

EPW/Equip: EPW Collection Point _CTCP_. Captured Documents to _TOC_.

Documents/Equip Required: None

Counterintel: None

Reports: Intel Update 15 minutes before mission start.
Green 2 due to TF S2 at 0600/1800 daily.

Hi: 89 Lo: 66 Precip: 0 Winds: 7 knots SW Vis: 7 miles Humidity: 70 %

	BMNT	SR	SS	EENT	MR	MS	%ILLUM	NVG ON	NVG OFF
13 OCT	0445	0530	1901	2023	2000	0030	70	— —	— —
14 OCT	0446	0531	1903	2025	2100	0050	83	— —	— —

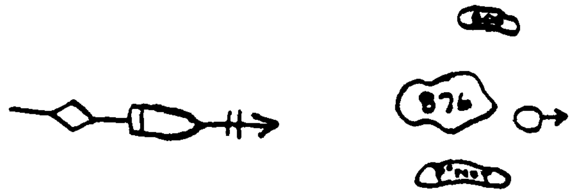
Remarks:

Appendix: 1 Enemy COA OFFICIAL: SP

Appendix _1_ (Enemy COAs) to Annex B to OPORD ________ DTG ___________

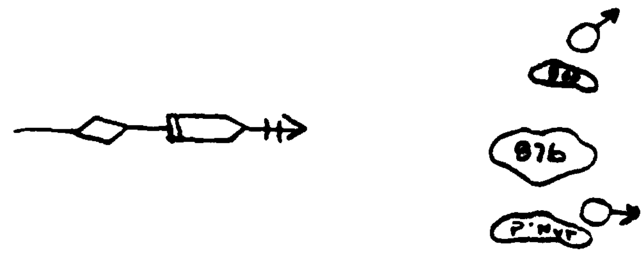
MOST LIKELY COA

CRP recons 10 km forward of FSE

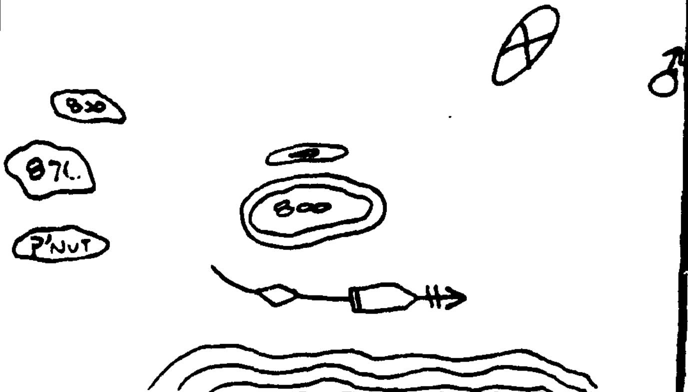


MOST DANGEROUS COA

CRPs recon 10 km forward of FSE



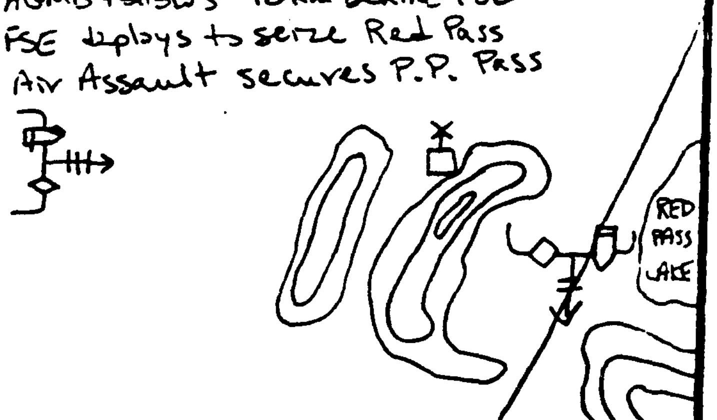
FSE travels south of Hill 780



FSE travels south of 780
CRPs recon key terrain

AGMB follows 10 km behind FSE
FSE deploys to seize Red Pass

AGMB follows 10 km behind FSE
FSE deploys to seize Red Pass
Air Assault secures P.P. Pass



B-4

Brigade-level Mission 1 Scenario Materials: Tactical Road March

Section B-4 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ________ MISSION 1 SIMNET Plan Sheet TRAINING AREA: ________

DATE: ________ START UP 13DEC AM FREQUENCY: ________

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66*	NJ 350900	1600					
2B	HQ	H ~~65~~ 63	NJ 340900	1600					
4A	CO/TM	A 66*	NJ 355900	1600					
4B	A	A 65*	NJ 355895	1600					
T9A		A 68	NJ 355905	1600					
T4C		A 11*	NJ 360900	1600					
		12							
		13							
T4D		A 14*	NJ 360895	1600					
T1D		A 21*	NJ 355910	1600					
		22							
		23							
T4F		A 24*	NJ 355915	1600					
T7C	D	D 31*	NJ 355890	1600					
		32							
		33							
T8C		D 34*	NJ 355885	1600					
4C	CO/TM	B 66*	NJ 330885	3200					
3C	B	B 65*	NJ 325885	3200					
T3D		B 68	NJ 329887	3200					
T5C		B 11*	NJ 330880	3200					
		12							
		13							
T5E		B 14*	NJ 325880	3200					
T5D		B 21*	NJ 340885	3200					
		22							
		23							
T5F		B 24*	NJ 345885	3200					
T7D		D ~~21~~ 31	NJ 323884	3200					
		32							
		33							
T8D		D ~~34~~ 24	NJ 319884	3200					

POC: MI: BFV: SAF: SI: TA:

SWILE

SIMNET Plan Sheet

UNIT: ______ TRAINING AREA: ______

DATE: ______ FREQUENCY: ______

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	COMM	C 66	NJ320900	4800			TM STRIKE		
2D	C	C 65	NJ 320 896	4800	3F	H36	NJ 370 900	0800	
T4B		C 68	NJ 320 903	4800	T3F	H61	NJ 369 899	0800	
T6E		C 11	NJ 315895	4800	3H	C21	NJ 378905	0808	
		12			3G	C22	NJ 376907	[illegible]	
		13			2G	C23	NJ 375 895	0800	
T6F		C 14	NJ315890	4800	2H	C24	NJ 375 890	0800	
		21							
		22			T3A	H56	NJ 345900	1600	ENGR CO CDR
		23			T9C	H51	NJ 345904	1600	ENGR PLT LDR
		24			T9D	H54	NJ 345896	1600	ENGR PLT SGT
					T8A	H71	NJ 336904	1600	ADA PLT LDR
T7E		C 31	NJ 315905	4800					
		32							
		33							
T7F		C 34	NJ 315 910	4800					
2F	COMM	D 66	NJ 330 910	0					
T2C	D	D 65	NJ 325 910	0					
T3E		D 68	NJ 332 910	0					
T7A		D 11	NJ 323 917	0					
		12							
		13							
T2A		D 14	NJ 318 917	0					
T6C		A ~~21~~ 31	NJ 340 915	0					
		22							
		23							
T9E		A ~~24~~ 34	NJ 345915	0					
T1C		B 31	NJ 330 920	0					
		32							
		33							
T8F		B 34	NJ 333920	0					
T3B	SCOUTS	H ~~71~~ 91	NJ 390 920	0800					
T2D		H ~~72~~ 94	NJ 390 910	0800					
		73							
		74							
		75							
		76							

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

PART II. COMBAT SUPPORT ELEMENTS

FIRE SUPPORT		LOCATION	AZIMUTH	AMMO	CSR	ADMINISTRATIVE NOTES
TYPE						
BATTERY #1		NJ 350960	1600			36 ROUNDS is basic load of the M109
BATTERY #2		NJ 350970	1600			Howitzer. The following ammo is
BATTERY #3		NJ 350980	1600			available: PD, PROX, RAAM, ADAM.
MORTAR PLATOON		NJ 328898	1600			88 ROUNDS is basic load of the M106.

CLOSE AIR SUPPORT		
AVAILABLE SORTIES:	PREPLANNED SORTIES:	

COMBAT ENGINEER ASSETS	LOCATION	ADMINISTRATIVE NOTES
Combat Engineer Company		Assets include: 3 Engineer Platoons (4 ea M113); 3 ea M128 GEMSS; 4 ea M57; and 4 ea M58A1 MICLIC.

PART III. COMBAT SERVICE SUPPORT ELEMENTS

DSA/BSA and TRAINS	LOCATION	SUPPORT PLATOON	or	COMPANY TRAINS	UNIT	LOCATION
CL III SUPPLY POINT		LOCATION			A	
CL III DISTRIBUTION POINT					B	
CL V SUPPLY POINT					C	
CL V DISTRIBUTION POINT					D	
UMCP						

PART IV. COMMAND AND CONTROL

TYPE:	LOCATION
BATTALION TACTICAL OPERATIONS CENTER	
ADMIN/LOGISTICS OPERATION CENTER	

ADDITIONAL NOTES/SPECIAL REQUIREMENTS

194 SAB FRAGO # DTG Dec 93 COPY OF

ENEMY: (GENERAL)

BDE ENEMY:

HIGHER MISSION: 24th ID will move into TAA to prepare to conduct combat operations

HIGHER INTENT: Move into TAAs quickly to allow for maximum time for preparation for combat operations

TASK ORG	1 70	2 33	2 136	3 123	1 24	19		
	ΔΔΔ□ A 19	ΔΔΔ□ B 19	□□□□ C 19	ΔΔΔΔ D 19				

ATTACH/DETACH:

BDE MISSION: BDE moves to TAAs along routes BLUE, RED, YELLOW, WHITE and GREEN to establish TAAs and prepare for combat operations

INTENT: I intend to move quickly into TAAs and prepare to for combat operations as soon as possible. Routes need to remain clear. Units will police their own vehicles but will not allow recovery operations to interfere with follow on units.

PIR: 1) Where are the DRT Teams
2) Divisional and Regimental Recon
3) Use of Chemicals

EEFI:

ACTION/ UNIT			
D/10			
TF 2-136	White RED SP		
TF 3-123	YELLOW GREEN White RED SP		
TF 1-70	BLUE SP		
TF 2-33	YELLOW White RED SP		
PRIORITY OF FIRES	D/10		
PRIORITY OF ADA	BLUE		
PRIORITY OF ENGINEER	MOVEMENT		

ADA YELLOW\ TIGHT	MOPP 0	OEG	STD TO

Concept
- ORDER OF MARCH 1-70, 3-123, 2-136, 2-33. D\10 ESTABLISH CHECK POINT WITH 2-33

UNIT	SP
1-70	1400
3-123	1430
2-136	1530
2-33	1630

CDR WITH TF 2-33	S3 WITH TF 2-33	MAIN 2-33
PYRO	CHALLENGE/PASSWORD PER SOI	

ANNEX E (ENGINEER) TO OPORD MSN 1

TASK ORGANIZATION: See OPORD

1. SITUATION.

a. Enemy.

(1) Terrain. Road network supports movement of forces. Orienteering is difficult without navigational aids. Topography is generally open terrain from SP to RP, providing good visibility for enemy long range recon assets. Limited restricted area exists vicinity NK 3115 along Route Blue. The TAA is also relatively open terrain well within Artillery FASCAM range.

(2) Weather. No major impact on engineer operations.

(3) Enemy engineer capability/activity.

Enemy obstacle systems are not expected to interfere with movements into the TAA. However, upon detection of our force, the enemy can employ both artillery and air delivered FASCAM. Both systems are rapid employment systems that can interdict unit movements.

b. Friendly.

c. Attachments/Detachments. 19th En Bn attached to 194th SAB. Be prepared to receive C/317th En Bn from 3d Bde, 24th ID.

2. MISSION. Bde moves to TAAs along routes BLUE, RED, YELLOW, WHITE, and GREEN to establish TAAs and prepare for combat operations.

3. EXECUTION.

a. Scheme of Engineer Operations. Main effort within the Bde area is mobility along specified routes. Upon closing into the TAAs, main effort is to survivability, then countermobility. Survivability to C3 systems, ADA assets, CSS assets, combat vehicles, in order. Countermobility will consist of preplanned situational obstacles that will disrupt and block a forward penetration into our TAAs.

(1) Obstacles. No zones identified by Corps. No belts identified by Bde.

(2) Situational Obstacles. Concept of employment is protection of the force while occupying TAAs. Each TF is allocated one Artillery delivered FASCAM minefield (400x300), with short SD time. Authority [illegible] delegated to TF Cdr.

b. Subunit Instructions. None.

c. Coordinating Instructions. Attachments must be complete NLT 6 hours prior to SP.

4. SERVICE SUPPORT.

a. Command Regulated Classes of Supply.
- FASCAM, ADAM, 155MM
- FASCAM, RAAM, 155MM
- FASCAM, BLU-91B, VOLCANO

b. Class IV/V (Obstacle) Supplies Distribution Plan. Bde will use push package as primary means of distribution. Be prepared to receive from supply point distribution if necessary. S&Ts from Corps will also be pushed forward as much as practical.

Priority of supplies to TF 1-70, TF 2-136, TF 3-123, TF 2-33, in order.

c. Transportation. Corps S&T support not known at this time.

d. Health Services Support. N/A.

e. Host Nation. N/A.

5. COMMAND AND SIGNAL.

a. Command.
En Bn Cdr located at Bde TOC.
Bde Engr located with S-3 plans.
En Bn S-3 located at En Bn TOC.

b. Signal.
Bde Engr monitors ACE, 19th En Bn cmd, Bde Engr.

ACKNOWLEDGE

CRADDOCK
COLONEL

Official.
/s/
RUSSO
Bde Engr

Appendices None.

CONCEPT OF SERVICE SUPPORT

BEFORE Top off combat vehicles, replenish UBL's in AA. Priority of replacements is to TF 1-70, 2-13 3-123, 2-33, 2-111, 19th EN. POM in order: M1, M2/M3, M109, Rec. Veh., fuel + ammo transport. Controlled sub. to unit level, minimize cannibalization. CL VII avail. after D+7, use BDAR kit. Pri. of protection is to ammo, fuel, SR's, rCP's. Pri. of MVMT is to Man. units, CL III, then CL II, 6 collected w/ATP. CEB avail. after D+4 in CSA loc TBD. Est. stockpiles of high use ammo in BP. Rear

DURING Pri. of replacements unchanged. MVMT prio. is to CL III + CL V FWD, MEDEVAC + Maint Evac (Rear). has SR prio. on commitment, LOG PAC security provided by MP plt. Cannibalization auth @ DS Level. Post[illegible] to Rearm/Refuel committed units. POM unchanged.

AFTER Reorg. priority is 1-70, 2-136, 3-123, 2-33, 1-211, 19th En in order. Goal is 10% CE. units [illegible] refit, refuel. POM remain the same. Rear MVMTS prior. is to MEDEVAC. Resp for [illegible] [illegible] pri. [illegible]

MAN ARM FUEL FIX MOVE PROTECTION

CSS EXECUTION MATRIX

PHASE	PTP	1-70 LRP	2-136 LRP	3-123 LRP
CALL SIGN				
TASK ORG				
I Prep	PTP 1 PTP 2 PTP 3	unit Disr BN LV	unit Disr BN LV	unit Disr BN LV
II MVMT to [illegible]	↓	L-5 282155 L-2 438102	L3 435205 L4 395145	L5 392 18 L6 362157
III MB	↓	↓	↓	↓
IV CA	↓	L-7	L-8	L-9

CLASS 1 & WATER: BSA > Active LRP

CLASS V: ATP Grid 0/0 — CSR PER DAY — EFFECTIVE: D-

120 105mm APDS	30	RAP 155mm HE	40/10	.50 CAL	3c
120 105mm HEAT	10	155mm ILLUM	10	7.62mm	6c
TOW	10	155mm SMK/WP	5/5	5.56mm SAW	8
25mm AP	500	CPHD DRAGON	12 3	5.56mm	21
25mm HE	500	AT4	4	155mm RAAM	
STINGER	4	155mm DPICM	80	155mm ADAM	

CLASS III & V PRIORITY: Before 1-70, 2-136 / During 7 / After 1-70, 3-

CLASS IX: Limit, shortage M1, M2/M3 Eng, M109 X mays — CORPS/DIV MCP: LOC TBD

MAINTENANCE PRIORITIES

TRACKS	M1	M2/M3	M109	Rec Ve
WHEELS	Fueler	Log Ammo		
UNIT	1-70	2-136	2-33	3-123

CSS SUPPORT MATRIX (SATELLITE)

UNIT	CLASS 1,2,5	MED EVAC	RECOVERY	
CSA Assets	✓	✓	✓	
DSA	✓	✓	✓	

BSA LOCATION: 215255

DATE	RATION CYCLE	LRP	TIME	WINDOW
D-12	C-C-T	unit Disr	0/c Coord	
D+2	C-C-T	↓	↓	↓
D+4	Z-C-T	↓	↓	↓
D+6	B-C-T	↓	↓	↓

CIVIL-MILITARY OPS:

MSR

NAME	TIME EFFECTIVE:
Blue	H-10
Red	H-10
Black	o/c

PRIORITY MOVEMENT ALONG MSR: ↑ Man, CL III, CL II, CL III ↓ MEDEVAC, Recover

NOTES: Black is Dirty RTE

CSS CHECK POINTS

LRP	GRID	LRP	GRID

SPECIAL INSTRUCTIONS

	BDE	CORPS	
WATER POINT	BSA		
GRREG	ATP		
KIA	TB NIA		
ASP	TBD		
AIR MEDEVAC	Freq TBD		
EPW/CA	MP Plt + SPT		

DECON

TEMP & AGENT	LINK UP SITE	DECON SITE	DIRTY ROUTE
CB			Black
VX			Black

B-5

Brigade-level Mission 2 Scenario Materials: Defense of Position

Section B-5 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ______ MISSION 2 SIMNET Plan Sheet TRAINING AREA: ______

DATE: ______ 14 DEC AM FREQUENCY: ______

PART I. COMBAT ELEMENTS

	SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
	3B	HQ	H 66*	NK 231215	4350					
	2B	HQ	H ~~65~~ 63	NK 216211	5158					
	4A	CO/TM	A 66*	NK170207	5567					
	4B	A	A 65*	NK172806	30					
AMMO	T9A		A 68	NK 172208	5519					
	T4C		A 11*	NK 174209	5503					
			12							
			13							
	T4D		A 14*	NK174209	4762					
	T1D		A 21*	NK 172206	5080					
			22							
			23							
	T4F		A 24*	NK 171206	4904					
	T7C		D 31*	NK 174211	4906					
			32							
			33							
	T8C		D 34*	NK 174213	4537					
	4C	CO/TM	B 66*	NK 261219	1935					
	3C	B	B 65*	NK 257223	804					
*	T3D		B 68	NK 258220	1041					
	T5C		B 11*	NK 257226	94					
			12							
			13							
	T5E		B 14*	NK 257224	723					
	T5D		B 21*	NK 263214	2806					
			22							
			23							
	T5F		B 24*	NK 264215	2586					
	T7D		D ~~31~~ 21	NK 259222	799					
			32							
			33							
	T8D		D ~~34~~ 24	NK 260221	1247					

(Site Staff use only)

POC: MI: BFV: SAF: ST: TA:

UNIT: ______

DATE: ______

SIMNET Plan Sheet

TRAINING AREA: ______

FREQUENCY: ______

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	CO/TM	C 66•	NK261204	3236			TM STRIKE		
2D	C	C 65•	NK261203	3082	3F	H36	NK199215	5304	
* T4B		C 68	NK260204	2219	* T3F	H69	NK205196	2865	
T6E		C 11•	NK264203	1707	3H	C21	NK206195	3206	
		12			3G	C22	NK204198	2177	
		13			2G	C23	NK199215	4354	
T6F		C 14•	NK264201	1493	2H	C24	NK200220	5197	
		21•							
		22			* T3A	H56	NK212234	5741	
		23			* T9C	H51	NK212235	4772	
		24•			* T9D	H54	NK212236	4700	
					* T8A	H71	NK220224	3779	
T7E		C 31•	NK257192	3571					
		32							
		33							
T7F		C 34•	NK256192	3795					
						*	NO AMMO		
2F	CO/TM	D 66•	NK212237	6387					
T2C		D 65•	NK211234	5653					
* T3E	D	D68	NK211237	5					
T7A		D 11•	NK208239	5644					
		12							
		13							
T2A		D 14•	NK208240	5825					
T6C		A ~~2~~-31	NK210235	4906					
		22							
		23							
T8E		A ~~2~~-34	NK209236	4581					
T1C		B 31•	NK261215	2586					
		32							
		33							
T8F		B 34•	NK213240	6104					
T3B	SCOUTS	H ~~2~~-91	NK184293	4383					
T2D		H ~~2~~-94	NK173231	5111					
		73•							
		74•							
		75•							
		76•							

UNIT: ______
DATE: ______

14 DEC 93 _ PM

SIMNET Plan Sheet

TRAINING AREA: ______
FREQUENCY: ______

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66	NJ 436926	4800					
2B	HQ	H ~~65~~ 63	NJ 437944	4800					
4A	COMM	A 66	NJ 425935	4800					
4B	A	A 65	NJ 425936	4800					
T9A		A 68	NJ 425 934	4800					
T4C		A 11	NJ 421 935	4800					
		12							
		13							
T4D		A 14	NJ 421 936	4800					
T3F ~~T4D~~		A 21	NJ 425939	4800					
		22							
		23							
T4F		A 24	NJ 425940	4800					
T7C		D 31	NJ 438948	5600					
		32							
		33							
T8C		D 34	NJ 438 491	5600					
4C	COMM	B 66	NJ 435926	4000					
3C	B	B 65	NJ 435927	4000					
T3D		B 68	NJ 435928	4000					
T5C		B 11	NJ 439920	4000					
		12							
		13							
T5E		B 14	NJ 439921	4000					
T5D		B 21	NJ 431927	4000					
		22							
		23							
T5F		B 24	NJ 431926	4000					
T7D		D ~~31~~ 21	NJ 435921	4000					
		32							
		33							
T8D		D ~~34~~ 24	NJ 435922	4000					

(Site Staff use only)

POC: MI: BFV: SAF: ST: TA:

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	COMM	C 66*	NJ 444927	2400			TM STRIKE		
2D	C	C 65*	NJ 444 928	2400	3F	H36	NJ 416935	4800	
T4B		C 68	NJ 444 929	2400	T ~~3F~~1D	H69	NJ 416934	4800	
T6E		C 11*	NJ 447 928	2400	3H	C21	NJ 412 935	4800	
		12			3G	C22	NJ 412 934	4800	
		13			2G	C23	NJ 412937	4800	
T6F		C 14*	NJ 447 929	2400	2H	C24	NJ 412936	4800	
		21*							
		22			T3A	H56	NJ 444935	4800	
		23			T9C	H51	NJ 444936	4800	
		24*			T9D	H54	NJ 444937	4800	
					T8A	H71	NJ 427 935	4800	
T7E		C 31*	NJ 444 923	2400					
		32							
		33							
T7F		C 34*	NJ 444 924	2400					
2F	COMM	D 66*	NJ 436 944	5600					
T2C	D	D 65*	NJ 436945	5600					
T3E		D68	NJ 436 946	5600					
T7A		D 11*	NJ 431 941	5600					
		12							
		13							
T2A		D 14*	NJ 431942	5600					
T6C		A ~~2~~-31	NJ 425930	~~4~~4800					
		22							
		23							
T8E		A ~~24~~-34	NJ 425931	4800					
T1C		B 31*	NJ 433946	5600					
		32							
		33							
T8F		B ~~34~~*	NJ 433947	5600					
T3B	SCOUTS	H ~~7~~-91	NK 313 012	4800					
T2D		H ~~7~~-94	NJ 272918	4800					
		73*							
		74*							
		75*							
		76*							

194th OPORD # [illegible] DTG COPY OF

ENEMY: (GENERAL)

BDE ENEMY:

HIGHER MISSION: XVIII ABC defends along PL OHIO NLT Dec 93 to deny enemy penetration of PL FLORIDA. O/O executes Corps counterattack to destroy the 31st CAA.

HIGHER INTENT: XVIII ABC Cdr's intent is to fight the deep battle to separate the enemy echelons and defeat each division in detail. At the endstate, the Corps will retain 80% of its combat power along PL FLORIDA with the enemy 31st CAA destroyed. The 194th SAB, 24 ID and 10 MT will defend in line along PL OHIO to fix and neutralize the lead echelons of 31st CAA. 101st ABD, Corps AVN and Corps Arty will interdict to cause separation between EN Echelons.

TASK ORG	1/70	2/33	3/123	2/136	1/201	19
D/10	A B C D A/19	A B C G B/19	A B C C/19	A B E C D		

ATTACH/DETACH:

BDE MISSION: 194th SAB defends in sector NLT Dec 93 from PL OHIO to PL FLORIDA to destroy 18 ~~MRD~~ TD West of PL FLORIDA.

INTENT/CONCEPT: I want D/10 to identify as much as possible of the FSEs. 1st Echelon regiments must be destroyed west of PL KENTUCKY. We will mass overwhelming fires to complete the destruction of the 2nd Echelon regiments West of PL FLORIDA. We will allow no enemy penetration beyond PL FLORIDA. Use your initiative to conduct counterattacks by fire whenever possible. Our endstate will be the destruction of the 18 ~~MRD~~ TD and four TFs defending forward of PL FLORIDA with an overall strength of more than 70%.

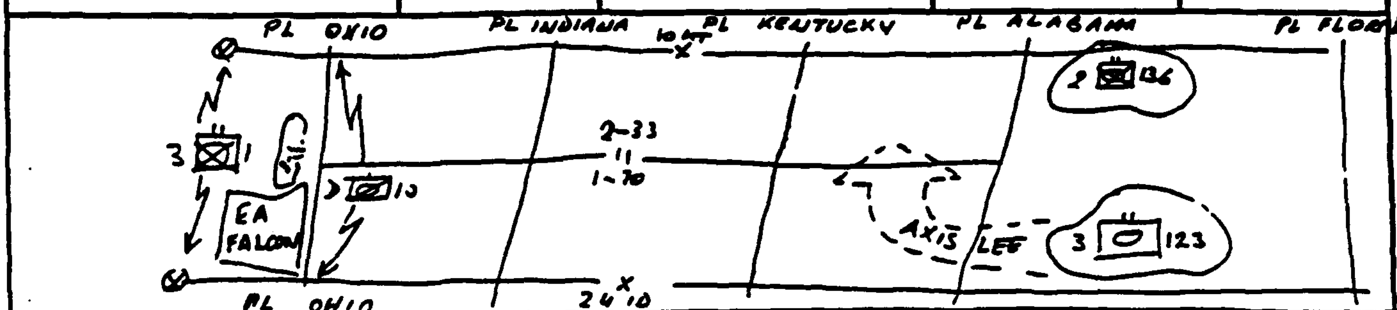
PIR: 1. Where are the 1st Echelon regiments of the 18 MRD

2. Where are the enemy's counterattack forces, where and when will he attack?

194th OPORD Mission 2 DTG COPY OF

ACTION / UNIT	PHASE I Movement to Defense	PHASE II Recon / C Recon	PHASE III Def INDIANA KENTUCKY	PHASE IV Def KENTUCKY → ALABAMA	PHASE V C ATK	
D-10	Screen Fwd 10	Screen Fwd Recon	Screen North	Screen North	Screen North	
TF 1-70	Move from TAA COBRA to Sector	C Recon Rearward Passage of 3-1 INF	Def in sector	Def in sector	Block enemy	
TF 2-33	Move into sector	C Recon Rearward passage of 3-1 INF	Def in sector	Def in sector	Def in sector	
TF 3-123	Move into AA	Bde Res	Bde Res	Bde Res	C Atk Axis LEE	
TF 2-136	Move into AA	Bde TCF Level III rear threat	Bde TCF	Bde TCF		
PRIORITY of FIRE	See ~~Eng~~ Fire Support Annex					
PRIORITY of ADA SPT	1) BSA 2) Manv 3) TOC					
PRIORITY of ENG SPT						

ADA YELLOW TIGHT	MOPP 0	OEG	STD TO	



CDR with TF 1-70	S3 with TF 2-33	MAIN See overlay	A/J PER SOI SWITCH TIME
PYRO	CHALLENGE/PASSWORD PER SOI		

INTENT FOR FIRES: Use Fires to attrit the FSE and the Main body of the regimental FD. Use CAS on the main body of the FD VIC EA FALCON. Use CPHD -VS- ADA, AT, Recon, and C^2. Use FASCAM to separate the FSE from the main body of the FD. During phase 1 & 2 POF is to D/10 to 1-70 to 2-33. POF for phases 3 & 4 is to TF 1-70, 2-33, & D-10. POF phase 5 is 1-70 to 3-123 when committed. D-10 is allocated 2 priority tgts in phase 1 and 2 as well as two CPHD pri tgts in phases 1 & 2. TF 1-70 is allocated 1 priority target and 2 CPHD pri tgts in phases 3 & 4. TF 1-70 has 3 radar zones for counter fire planning. BDE CFL is OHIO any elements W of CFL must have NFA

PHASE/ EVENT	Movement from TAA	CTR Recon/ Prep Def	Defend Irdy to Ky	Defend Ky to [illegible]	Counter attack	
D/10	POF →	WH0010, 0011, 0012, 0013, 0014				
2-33		WH0013, 0014	WH 0017, 0018	WH0032, 0033		
1-70	WH0010 → 0819	WH0009, 0011, 0012 POF →	WH0015, 0016	WH0029, 0030, 0031		
2-136						
3-123					WH 0030, 0819 POF	

FA ORG FOR COMBAT
1-201 FA (155 SP, AS) DS to 1st
1-141 FA (155 TOW) R to 1-201

AMMO AVAILABLE

HE	720	WP	96	RAAMS	96
DPICM	1968	HC	0	ADAMS	24
ILLUM	48	RAP	216	WP NEW	96
COPPERHEAD	24				

REFINEMENT CUT OFF TIME: 0900 14 Dec 93

FASCAM MINEFIELDS

TGT NO.	DENSITY	WIDE	DURATION
0910	MD/h	400x400	5 hr
0911	MD/h	400x400	5 hr

FIRE SUPPORT REHEARSAL TIME: 0900 14 Dec 93

FIRE SUPPORT AND CONTROL MEASURES
BDE CFL is PL OHIO

CLOSE AIR SUPPORT
8 Sorties for BDE
4 for planning to 1-70

A-10 equipped

HIGH PAYOFF TARGETS
1. Arty
2. ADA
3. Eng
4. Man
5. Recon

CDR GUIDANCE

Arty	Bn 4	4 veh moving or static
ADA	Bn 3	1 veh [illegible]
Eng	Bn 3	Near breech
Man	Bn 5	3 veh moving
Recon	CPH only	single vehicles
C^2	CPH only	single vehicles

COORDINATING INSTRUCTIONS:
Send all actual position locations to BDE FSE [illegible].
ARTY LOC 1-201 VIC (NS 4297) 1-141 VIC (NS 405999)

BDE TARGET LIST

	TGT NO.	LOCATION	DESCRIPTION	SHOOTER/ALT	REMARKS
1.	WH0010	NJ249947	RD JUNC.(SEAD)	D-10/TF 1-70	CAS EA FALL
2.	WH0011	NJ299975	RD JUNC.	D-10/TF 1-70	
3.	WH0012	NK303955	RD JUNC.	D-10/TF 1-70	
4.	WH0013	NK308042	RD JUNC.	D-10/TF 2-33	
5.	WH0014	NK310060	RD JUNC.	D-10/TF 2-33	
6.	WH0015	NJ346964	RD JUNC.	TF 1-70	
7.	WH0016	NJ362969	SPUR	TF 1-70	
8.	WH0017	NK358087	RD JUNC.	TF 2-33	
9.	WH0018	NK377089	HILLSIDE	TF 2-33	
10.	WH0019	NJ388960	RD JUNC.	TF 2-136	
11.	WH0031	NJ401998	RD JUNC.	TF 2-136	
12.	WH0032	NK411115	RD JUNC.	TF 2-136	
13.	WH0033	NK430094	RD JUNC.	TF 3-123	
14.	WH0910	NJ280935	FASCAM	TF 1-70	ATT 1600
15.	WH0911	NJ297918	FASCAM	TF 1-70	ATT 1600
16.	WH0912	NK264021	FASCAM	TF 1-70	ATT 1600
17.	WH0913	NK264025	FASCAM	TF 1-70	ATT 1600
18.	WH8010	NK290151	RD JUNC.	TF 1-70	
19.	WH8011	NK310150	RD JUNC.	TF 1-70	
20.	WH8012	NK331175	RD JUNC.	TF 1-70	
21.	WH8013	NK366175	RD JUNC.	TF 1-70	
22.	WH8014	NK425155	RD JUNC.	TF 1-70	
23.	WH8015	NK472147	RD JUNC.	TF 1-70	
24.	WH8016	NK498112	RD JUNC.	TF 1-70	
25.	WH8017	NK495095	RD JUNC.	TF 1-70	
26.	WH8018	NK509092	RD JUNC.	TF 1-70	
27.	WH8019	NJ473985	RD JUNC.	TF 1-70	

CONCEPT OF SERVICE SUPPORT

BEFORE Top off combat vehicles, replenish UBL in AA. Priority of replacements is to TF 1-70, 2-136, 3-123, 2-33, 2-111, 19 ENGR. POM in order: A1, M2/M3, M109, Rec. Veh., fuel & ammo transportation. Controlled exch. to unit level, minimize cannibalization. CL VII avail. from D+7, use BDAR kits. Pri. of protection is to ammo, fuel, SR's, CCP's. Pri. of MVMT is to Man. units, CL III, then CL V, GR. Collected w/ATP. CEB avail. after D+4 in CSA loc TBD est. stockpiles of hygiene items in BP. Remain

DURING Pri. of replacements unchanged. MVMT prio. is to CL III + CL V FWD, MEDEVAC Main Evac (Rear). 1- has SR prior. on commitment. LOG PAC security provided by MP Plt. Cannibalization auth @ DS level. POS moves to Rearm/Refuel committed units. POM unchanged.

AFTER Recovery priority is 1-70, 2-136, 3-123, 2-33, 1-211, 19th Eng in order. Goal is 10% CE. unit rear refit, refuel. POM remain the same. Rear MVMTS prio. is to MEDEVAC. Resp for [illegible] [illegible] pri. [illegible]

MAN **ARM** **FUEL** **FIX** **MOVE** **PROTECTION**

CSS EXECUTION MATRIX

PHASE	PTP	1-70 LRP	2-136 LRP	3-123 LRP
CALL SIGN				
TASK ORG				
I Prep	PTP 1 PTP 2 PTP 3	unit Dist BN LV	unit Dist BN LV	unit Dist BN LV
I MVMT to contact	↓	L-5 272152 L-7 438102	L3 435205 L4 395145	L5 392218 L6 362157
II MB	↓	↓	↓	↓
IV CA	↓	L-7	L-8	L-9

CLASS 1 & WATER: BSA > Active LRP

CLASS V ATP Grid 010 **CSR PER DAY** **EFFECTIVE:** D-

120 mm APDS	30	RAP mm HE	40/10	.50 CAL	300
120 mm HEAT	10	mm ILLUM	10	7.62mm	600
TOW	10	mm SMK/WP	5/5	5.56mm SAW	8[illegible]
25mm AP	500	CPHD DRAGON	12 3	5.56mm	21[illegible]
25mm HE	500	AT4	4	155mm RAAM	
STINGER	4	mm DPICM	80	155mm ADAM	[illegible]

CLASS III & V PRIORITY: Before 1-70, 2-136 / During ? / After 1-70, 3-1[illegible]

CLASS II: Cont. Shortage M1, M2/M3 for ... M109 ... **CORPS/DIV MCP** LOC TBD

MAINTENANCE PRIORITIES

TRACKS	M2	M3/M3	M109	Rec Veh
WHEELS	Fuelers	CL V Ammo		
UNIT	1-70	2-136	2-33	3-123

CSS SUPPORT MATRIX (SATELLITE)

UNIT	CLASS 1,3,5	MED EVAC	RECOVERY
CSA Assets	✓	✓	✓
DSA	✓	✓	✓

BSA LOCATION: 215755

DATE	RATION CYCLE	LRP	TIME	WINDOW
D-12	C-C-T	unit Dist ↓	O/C Coord	
D+2	C-C-T	↓	↓	↓
D+4	E-C-T	↓	↓	↓
D+6	B-C-T	↓	↓	↓

CIVIL-MILITARY OPS:

MSR

NAME	TIME EFFECTIVE:
Blue	H-10
Red	H-10
Black	O/C

PRIORITY MOVEMENT ALONG MSR: ↑ Man, CL IV, CL V, CL III ↓ MEDEVAC, Recove

NOTES Black is Dirty RTE

CSS CHECK POINTS

LRP	GRID	LRP	GRID

SPECIAL INSTRUCTIONS

	BDE	CORPS
WATER POINT	BSA	
GRREG	ATP	
KIA	TB NIP	
ASP	TBD	
AIR MEDEVAC	Fwd TBD	
EPW/CA	MP Plt + SPT	

DECON

TEMP & AGENT	LINK UP	DECON SITE	DIRTY ROUTE
CB			Black
VX			Black

B-6

Brigade-level Mission 3 Scenario Materials:
Defense with a Change of Mission Leading to a Withdrawal

Section B-6 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ______
DATE: ______ 15 DEC

SIMNET Plan Sheet

AM - CONTINUED

TRAINING AREA: ______
FREQUENCY: ______

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66	NJ436926	4800					
2B	HQ	H ~~65~~ 63	NJ 437945	4900					
4A	COMM	A 66	NJ 425935	4800					
4B	A	A 65	NJ 356919	4600					
T9A		A 68	NJ 426935	4700					
T4C		A 11	NJ 345 931	4800					
		12							
		13							
T4D		A 14	NJ 345933	4600					
T3F		A 21	NJ 354 922	4800					
		22							
		23							
T4F		A 24	NJ 354924	4800					
T7C		D 31	NJ 437948	5400					
		32							
		33							
T8C		D 34	NJ 438949	5800					
4C	COMM	B 66	NJ 359958	4200					
3C	B	B 65	NJ 359 957	4800					
T3D		B 68	NJ 352964	4100					
T5C		B 11	NJ 364953	4700					
		12							
		13							
T5E		B 14	NJ 362 954	4600					
T5D		B 21	NJ 351967	4600					
		22							
		23							
T5F		B 24	NJ 351968	4600					
T7D		D ~~31~~ 21	NJ352965	4600					
		32							
		33							
T8D		D ~~34~~ 24	NJ 352 966	4100					

(Site Staff use only)
POC: ______ M1: ______ BFV: ______ SAF: ______ ST: ______ TA: ______

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	CO/TM	C 66•	NJ 385898	5400			TM STRIKE		
2D	C	C 65•	NJ 364897	3200	3F	H36	NK 397015	2500	
T4B		C 68	NJ 351967	4200	T[illegible]1D	H69	NJ 381996	5800	
T6E		C 11•	NJ 381898	5200	3H	C21	NK 379007	200	
		12			3G	C22	NK 381006	5500	
		13			2G	C23	NK 380009	4800	
T6F		C 14•	NJ 384897	4400	2H	C24	NK 380012	4700	
		21•							
		22			T3A	H56	NJ 364943	4800	
		23			T9C	H51	NJ 364944	4800	
		24•			T9D	H54	NJ 444937	4800	
					T8A	H71	NJ 438944	5500	
T7E		C 31•	NJ 385907	4600					
		32							
		33							
T7F		C 34•	NJ 385906	4200					
2F	CO/TM	D 66•	NJ 437945	5500					
T2C	D	D 65•	NJ 436945	5600					
T3E		D68	NJ 437947	3400					
T7A		D 11•	NJ 430942	5900					
		12				MORTARS	NJ 369938	5400	
		13				ARTY 1	NJ 420987	3900	
T2A		D 14•	NJ 431942	100		ARTY 2	NJ 414990	3900	
						ARTY 3	NJ 430990	3900	
T6C		A 2-31	NJ 355916	4300					
		22				ENGR	NJ 393946		
		23							
T8E		A 2-34	NJ 354918	4400					
T1C		B 31•	NJ 435945	5500					
		32							
		33							
T8F		B 34•	NJ 435944	5800					
T3B	SCOUTS	H 2-91	NJ 320995	6000					
T2D		H 2-94	NJ 281925	5300					
		73•							
		74•							
		75•							
		76•							

ENEMY: (GENERAL)

BDE ENEMY:

HIGHER MISSION: XVIII Corps continues to defend in sector to deny the enemy access to highway 15. Prepares to pass III corps elements forward in support of theater commander goals.

HIGHER INTENT: I intend to continue to defend in sector to deny the enemy access to highway 15. We will continue to use army and air force aviation to harass and disrupt the enemiés attempt to mass in preparation for offensive operations. We must maintain contact with the enemy across the corps front.

TASK ORG	1 70	2 33	3 123	1 201	D 10			
	A B C D A 19	A B C G B 19	A B C D C 19					

ATTACH/DETACH:

BDE MISSION: 194th SAB conducts movements to contact Dec 93 to clear enemy in zone and seize objectives MIAMI and DALLAS. Be prepared to continue the attack to the north.

INTENT: I intend to conduct aggressive Recon with D/10 forward to gain contact with the enemy, fix and hand off the battle to the follow on TFs TF 2-33 will fix the enemy elements west of PL Alabama and allow TF 1-70 to conduct movement along axis Longstreet and seize objective Miami. 3-123 AR will conduct movement along axis Chamberlain and seize objective Dallas. My desired endstate is to have all elements combat effective with a TF on Obj Miami, a Bn on Obj Dallas, and a TF in Res. I define success as accomplishing the desired endstate and clearing the zone of all MRPs or larger units while suffering less than 30% casualties.

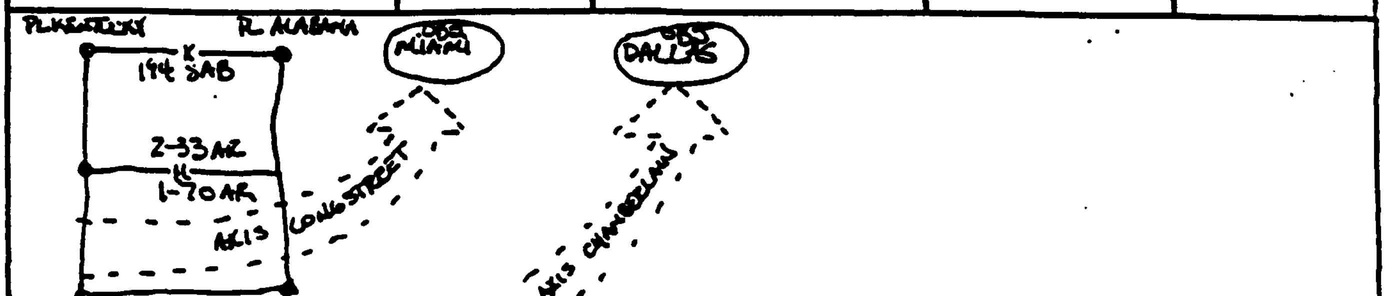
PIR: 1. Enemy PLT or larger units
2. Obstacles
3. T-80 sightings
4. Enemy MOPP level

EEFI: 1. Enemy contact 2. Changes in combat power 3. Changes in unit stat

194th OPORD DTG COPY OF

ACTION / UNIT	PASSAGE OF LINES	MOVEMENT TO CONTACT	SEIZE THE OBJECTIVES	CONSOLIDATE [illegible]		
D/10	CONDUCT ZONE RECON →	→	SCREEN NORTH OF OBJECTIVES →	→		
TF 1-70	CROSS PL KENTUCKY	MOVE ALONG AXIS LONGSTREET	SEIZE OBJ MIAMI	ORIENT NORTHWEST		
TF 2-33	FIX AND DESTROY ENEMY IN SECTOR →	→	IN RESERVE →	→		
3-123 AR	CROSS PL KENTUCKY	MOVE ALONG AXIS CHAMBERLAIN	SEIZE OBJ DALLAS	ORIENT NORTHEAST		
PRIORITY of FIRE	D/10, 2-33 1-70, 3-123 →	→	→	→		
PRIORITY of ADA SPT	1-70, 2-33 3-123, [illegible] TOC →	→	→	→		
PRIORITY of ENG SPT	M/C/S →	→	→	C/S/M		

ADA YELLOW/TIGHT	MOPP	OEG	STD TO	



CDR	S3	MAIN	A/J
			SWITCH TIME

PYRO	CHALLENGE/PASSWORD	OFFICIAL

CONCEPT OF SERVICE SUPPORT

BEFORE Top off combat vehicles, replenish UBL's in AA. Priority of replacements is to TF 1-70, 2-136, 3-123, 2-33, 2-111, 19th EN. POM in order: M1, M2/M3, M109, Rec. Veh., fuel + ammo transports. Controlled sub. to unit level, minimize cannibalization. CL VIII avail. from D+7, use BDAR kit. Pri. of protection is to ammo, fuel, SR's, CP's. Pri. of MVMT is to Man. units, CL III, then CL II, G1. Collected w/ ATP. CEB avail. after D+4 in CSA loc TBD. Est. stockpiles of high use ammo in BP. Rcns

DURING Pri. of replacements unchanged. MVMT pri. is to CL III + CL V FWD, MED + Maint Evac (Rear). has SR prior. on commitment. LOG PAC security provided by MP Plt. Cannibalization auth @ DS Level. Pri. is Rearm/Refuel committed units. POM unchanged.

AFTER Reorg. priority is 1-70, 2-136, 3-123, 2-33, 1-211, 19th EN in order. Goal is 70% CE. refit, refuel, POM remains the same. Rear MVMTS prior. is to MEDEVAC. Prep for future opns. pri.

MAN ARM FUEL FIX MOVE PROTECTION

CSS EXECUTION MATRIX

PHASE	PTP	1-70 LRP	2-136 LRP	3-123 LRP
CALL SIGN				
TASK ORG				
I Prep	PTP 1 PTP 2 PTP 3	unit Dist BN LV	unit Dist BN LV	unit Dist BN LV
I MVMT to contact		L-5 282152 L-2 438102	L3 435205 L4 395145	L5 392218 L6 362157
II MB				
IV CA		L-7	L-8	L-9

CLASS I & WATER: BSA > Active LRP

CLASS V: ATP Grid 010 — CSR PER DAY — EFFECTIVE: D-

120mm APDS	30	120mm HE (RAP)	40/10	.50 CAL	30.
120mm HEAT	10	155mm ILLUM	10	7.62mm	6
TOW	10	155mm SMK/WP	5/5	5.56mm SAW	8
25mm AP	500	CPHD / DRAGON	12 / 3	5.56mm	21
25mm HE	500	AT4	4	155mm RAAM	
STINGER	4	155mm DPICM	80	155mm ADAM	

CLASS III & V PRIORITY: Before 1-70, 2-136 / During ? / After 1-70, 3-

CLASS IX: Land. shortage M1, M2/M3 ... M109 ... CORPS/DIV MCP: LOC TBD

MAINTENANCE PRIORITIES

TRACKS	M1	M2/M3	M109	Rec Ve
WHEELS	Fuelers	Lt Ammo		
UNIT	1-70	2-136	2-33	3-12

CSS SUPPORT MATRIX (SATELLITE)

UNIT	CLASS 1,3,5	MED EVAC	RECOVERY	
CSA assets	✓	✓	✓	
DSA	✓	✓	✓	

BSA LOCATION: 215255

DATE	RATION CYCLE	LRP	TIME	WINDOW
D-12	C-C-T	unit Dist	O/C Coord	
D+2	C-C-T			
D+4	C-C-T			
D+6	B-C-T			

CIVIL-MILITARY OPS:

MSR

NAME	TIME EFFECTIVE
Blue	H-10
Red	H-10
Black	O/C

PRIORITY MOVEMENT ALONG MSR: ↑ Man, CL IV, CL II, CL III ↓ MEDEVAC, Rec Evac

NOTES: Black is Dirty RTE

CSS CHECK POINTS

LRP	GRID	LRP	GRID

SPECIAL INSTRUCTIONS

	BDE	CORPS
WATER POINT	BSA	
GRREG	ATP	
KIA	TR NIP	
ASP	TBD	
AIR MEDEVAC	Fwd TBD	
EPW/CA	MP Plt + Spt	

DECON

TEMP & AGENT	LINK UP SITE	DECON SITE	DIRTY ROUTE
CB			Black
VX			Black

B-7

Brigade-level Mission 4 Scenario Materials: Attack to Seize Objectives

Section B-7 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ____________
DATE: ____________

MISSION 4

SIMNET Plan Sheet

16 DEC AM STARTUP

TRAINING AREA: ____________
FREQUENCY: ____________

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66•	NK 580140	4800					
2B	HQ	H ~~66~~•63	NK 58143	4800					
4A	CO/TM	A 66•	NK 565140	4800					
4B	A	A 65•	NK 565143	4800					
T9A		A 68	NK 565137	4800					
T4C		A 11•	NK 550139	4800					
		12							
		13							
T4D		A 14•	NK 550141	4800					
T3F		A 21•	NK 555149	4800					
		22							
		23							
T4F		A 24•	NK 555151	4800					
T7C		D 31•	NK 555129	4800					
		32							
		33							
T8C		D 34•	NK 555131	4800					
4C	CO/TM	B 66•	NK 580148	0					
3C	B	B 65•	NK 578148	0					
T3D		B 68	NK 582148	0					
T5C		B 11•	NK 579155	0					
		12							
		13							
T5E		B 14•	NK 581155	0					
T5D		B 21•	NK 569155	0					
		22							
		23							
T5F		B 24•	NK 571155	0					
T7D		D ~~31~~•21	NK 589155	0					
		32							
		33							
T8D		D ~~34~~•24	NK 591155	0					

(Site Staff use only)
POC: ______ MI: ______ BFV: ______ SAF: ______ SI: ______ TA: ______

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	CO/TM	C 66*	NK 595140	1600			TM STRIKE		
2D	C	C 65*	NK 595143	1600	3F	H36	NK 531143	4800	
T4B		C 68	NK 595137	1600	T1D	H69	NK 532145	4800	
T6E		C 11*	NK 603145	1600	3H	C21	NK 603140	1600	
		12			3G	C22	NK 604141	1600	
		13			2G	C23	NK 604138	1600	
T6F		C 14*	NK 603143	1600	2H	C24	NK 603139	1600	
		21*							
		22			T3A	H56	NK 583140	4800	
		23			T9C	H51	NK 580150	0	
		24*			T9D	H93	NK 534136	4800	
					T8A	H71	NK 575140	4800	
T7E		C 31*	NK 603135	1600					
		32							
		33							
T7F		C 34*	NK 603133	1600					
2F	CO/TM	D 66*	NK 580 125	3200					
T2C	D	D 65*	NK 583 125	3200					
T3E		D 68	NK 577125	3200					
T7A		D 11*	NK 581115	3200					
		12							
		13							
T2A		D 14*	NK 579115	3200					
T6C		A ~~21~~ 31	NK 571118	3200					
		22							
		23							
T8E		A ~~24~~ 34	NK 569118	3200					
T1C		B 31*	NK 591118	3200					
		32							
		33							
T8F		B 34*	NK589118	3200					
T3B	SCOUTS	H ~~21~~ 91	NK 530145	4800					
T2D		H ~~22~~ 94	NK 535135	4800					
		73*							
		74*							
		75*							
		76*							

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

PART II. COMBAT SUPPORT ELEMENTS

FIRE SUPPORT	LOCATION	AZIMUTH	AMMO	CSR	ADMINISTRATIVE NOTES
TYPE					
BATTERY #1	NK 523105				
BATTERY #2	NK 523100				36 ROUNDS is basic load of the M109
BATTERY #3	NK 523095				Howitzer. The following ammo is
MORTAR PLATOON	NK 575135				available: PD, PROX, RAAM, ADAM.
					88 ROUNDS is basic load of the M106.

CLOSE AIR SUPPORT	
AVAILABLE SORTIES:	PREPLANNED SORTIES:

COMBAT ENGINEER ASSETS	LOCATION	ADMINISTRATIVE NOTES
Combat Engineer Company		Assets include: 3 Engineer Platoons (4 ea M113); 3 ea M128 GEMSS; 4 ea M57; and 4 ea M58A1 MICLIC.

PART III. COMBAT SERVICE SUPPORT ELEMENTS

DSA/BSA and TRAINS	LOCATION	SUPPORT PLATOON LOCATION	or	COMPANY TRAINS	UNIT	LOCATION
CL III SUPPLY POINT					A	
CL III DISTRIBUTION POINT					B	
CL V SUPPLY POINT					C	
CL V DISTRIBUTION POINT					D	
UMCP						

PART IV. COMMAND AND CONTROL

TYPE:	LOCATION
BATTALION TACTICAL OPERATIONS CENTER	
ADMIN/LOGISTICS OPERATION CENTER	

ADDITIONAL NOTES/SPECIAL REQUIREMENTS

UNIT: ______
DATE: ______ 16 DEC PM
PART I. COMBAT ELEMENTS

SIMNET Plan Sheet

TRAINING AREA: ______
FREQUENCY: ______

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66	NK 211 213	1600					
2B	HQ	H ~~65~~ 63	NK 210230	1600					
4A	CO/TM	A 66	NK 230219	1600					
4B	A	A 65	NK 230218	1600					
T9A		A 68	NK 229219	1500					
T4C		A 11	NK 352178	3800					
		12							
		13							
T4D		A 14	NK 229221	870					
T3F		A 21	NK 230215	3960					
		22							
		23							
T4F		A 24	NK 229217	1700					
T7C		D 31	NK 229 221						
		32							
		33							
T8C		D 34	NK 228222	500					
4C	CO/TM	B 66	NK 188255	0					
3C	B	B 65	NK 189256	0					
T3D		B 68	NK 190 255	5100					
T5C		B 11	NK 190 259	0					
		12							
		13							
T5E		B 14	NK 190 258	0					
T5D		B 21	NK 188 257	4800					
		22							
		23							
T5F		B 24	NK 187 256	5100					
T7D		D ~~31~~ 21	NK 185255	3860					
		32							
		33							
T8D		D ~~34~~ 24	NK 185254	4430					

(Site Staff use only)
POC: ______ M1: ______ BFV: ______ SAF: ______ ST: ______ TA: ______

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	CO/TM	C 66•	NK164236	4800			TM STRIKE		
2D	C	C 65•	NK172232	4800	3F	H36	NK 245191	1600	
T4B		C 68	NK190255	5100	T[illegible]D	H69	NK 223205	2400	
T6E		C 11•	NK170231	4960	3H	C21	NK164239	4800	
		12			3G	C22	NK165240	4800	
		13			2G	C23	NK 164238	4800	
T6F		C 14•	NK169233	5000	2H	C24	NK 163239	4800	
		21•							
		22			T3A	H56	NK175206	3200	
		23			T9C	H51	NK 189257	1200	
		24•			T9D	H[illegible]	NK 225201	2400	
					T8A	H71	NK 165237	3200	
T7E		C 31•	NK171234	5240					
		32							
		33							
T7F		C 34•	NK171223						
2F	CO/TM	D 66•	NK176198	4800					
T2C	D	D 65•	NK177199	4200					
T3E		D68	NK178199	4200					
T7A		D 11•	NK177195	3800					
		12							
		13							
T2A		D 14•	NK178195	3800					
T6C		A ~~2~~-31	NK185195	3800					
		22							
		23							
T8E		A ~~2~~-34	NK186195	3800					
T1C		B 31•	NK190195	3800					
		32							
		33							
T8F		B 34•	NK191195	3800					
T3B	SCOUTS	H ~~7~~-91	NK225205	2400					
T2D		H ~~7~~-94	NK225203	2400					
		73•							
		74•							
		75•							
		76•							

194 SAB FRAGO 93-4 MISSION 4 DTG Dec 93

ENEMY: (GENERAL)

BDE ENEMY:

HIGHER MISSION: XVIII Corps continues to defend in sector to deny the enemy access to highway 15. Prepares to pass III corps elements forward in support of theater commander goals.

HIGHER INTENT: I intend to continue to defend in sector to deny the enemy access to highway 15. We will continue to use army and air force aviation to harass and disrupt the enemies attempt to mass in preparation for offensive operations. We must maintain contact with the enemy across the corps front.

TASK ORG	1 70	2 33	3 123	1 201	D 10			
	A B C D A 14	A B C G B 14	A B C D C 14					

ATTACH/DETACH:

BDE MISSION: 194th SAB conducts movements to contact Dec 93 to clear enemy in zone and seize objectives KNIFE and RAZOR. Be prepared to continue the attack to the North.

INTENT: I intend to conduct aggressive Recon with D/10 forward to gain contact with the enemy, fix and hand off the battle to the follow on TFs. TF 1-70 will conduct movement to contact along axis Bear and seize Obj Knife. TF 2-33 will conduct movement to contact along axis Bull and seize Obj Razor. My desired endstate is to have all elements combat effective with a TF on Objective Knife and a TF on Objective Razor. I define success as accomplishing the desired endstate and clearing the zone of all MRPs or larger units while suffering less than 30% casualties

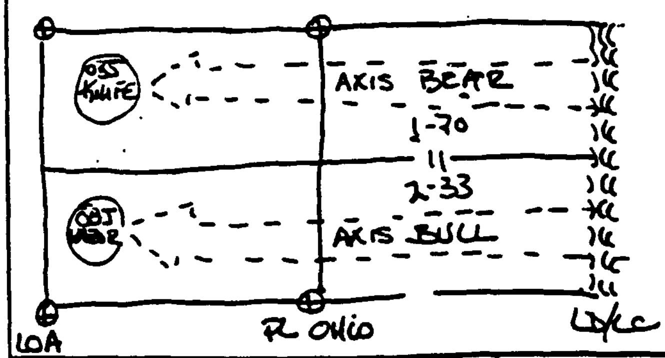
PIR:
1. Enemy PLT or larger units
2. Obstacles
3. T-80 sightings
4. Enemy MOPP level

EEFI: 1. Enemy contact 2. Changes in combat power 3. Changes in unit statu

D/10	CONDUCT ZONE RECON		SCREEN WEST of OBJECTIVES	
TF 1-70	CROSS LD/LC	Move along AXIS BEAR	SEIZE OBJ Knife	ORIENT Northwest
TF 2-33	CROSS LD/LC	Move along AXIS BULL	SEIZE OBJ RAZOR	ORIENT SOUTHWEST
TF 3-123	RESERVE			
TF 2-136	OPCON TO	3-24 ID		
PRIORITY OF FIRES	D/10, 1-70 2-33, 3-123			
PRIORITY OF ADA	2-33, 1-70 3-123, BSA TLC			
PRIORITY OF ENGINEER	M/C/S			C/S/M

ADA YELLOW/TIGHT	MOPP	OEG	STD TO	

Concept



CDR WITH TF	S3 WITH TF	MAIN	A/J PER
			SWITCH
PYRO	CHALLENGE/PASSWORD PER SOI		OFFICIAL FINK.

CONCEPT OF SERVICE SUPPORT

BEFORE Top off [illegible], replenish UBL's in AA. Priority of replacements in TF 1-70, 2-136, 3-123, 2-33, 2-111, 19 EN. POM in order: M1, M2/M3, M109, Rec. Veh., fuel + ammo transporters. Controlled exch. to unit level, minimize cannibalization. CL VII avail. from D+7, use BDAR kit. Pri. of protection is to ammo, fuel, SR's, CP's. Pri. of MVMT is to Man. units, CL III, then CL V, CL [illegible] collected w/ATP. CEB avail. after D+4 in CSA loc TBD. Est. stockpiles of high use ammo in BP. Rems.

DURING Pri. of replacements unchanged. MVMT pri. is to CL III + CL V FWD, MED + Maint [illegible]. has SR prior. on commitment. LOG PAC security provided by MP Plt. Cannibalization auth @ DS Level. POS [illegible] Rearm/Refuel committed units. POM unchanged.

AFTER Reorg. priority is 1-70, 2-136, 3-123, 2-33, 1-211, 19th EN in order. Goal is 70% CE. [illegible] refit, refuel, POM remains the same. Rear MVMTS prior. is to MEDEVAC. [illegible]

MAN ARM FUEL FIX MOVE PROTECTION

CSS EXECUTION MATRIX

PHASE	PTP	1-70 LRP	2-136 LRP	3-123 LRP
CALL SIGN				
TASK ORG				
I Prep	PTP 1 PTP 2 PTP 3	unit Dist BN LV	unit Dist BN LV	unit Dist BN LV
II MVMT		L-5 282158 L-2 438102	L3 435205 L4 395145	L5 392218 L6 362157
III MB				
IV CA		L-7	L-8	L-9

CLASS 1 & WATER: BSA > Active LRP

CLASS V: ATP Grid 0/0

CSR PER DAY — EFFECTIVE: D-

120 mm APDS	30	RAP mm HE	40/10	.50 CAL	30[illegible]
120 mm HEAT	10	mm ILLUM	10	7.62mm	6[illegible]
TOW	10	mm SMK/WP	5/5	5.56mm SAW	8[illegible]
25mm AP	500	CPHD / DRAGON	12 / 3	5.56mm	21[illegible]
25mm HE	500	AT4	4	155mm RAAM	
STINGER	4	mm DPICM	80	155mm ADAM	[illegible]

CLASS III & V PRIORITY: Before 1-70, 2-136 / During ? / After 1-70, 3-[illegible]

CLASS IX: M1, M2/M3 Eng [illegible], Suspension, M109 X [illegible] — CORPS/DIV MCP: LOC TBD

MAINTENANCE PRIORITIES

TRACKS	M1	M2/M3	M109	Rec Veh
WHEELS	Fuelers	260 Ammo		
UNIT	1-70	2-136	2-33	3-123

CSS SUPPORT MATRIX (SATELLITE)

UNIT	CLASS 1,3,5	MED EVAC	RECOVERY	
CSA Assets	✓	✓	✓	
DSA	✓	✓	✓	

BSA LOCATION: 215255

DATE	RATION CYCLE	LRP	TIME	WINDOW
D-12	C-C-T	unit Dist	O/C Coord	
D+2	C-C-T			
D+4	E-C-T			
D+6	B-C-T			

CIVIL-MILITARY OPS:

MSR

NAME	TIME EFFECTIVE:
Blue	H-10
Red	H-10
Black	O/C

PRIORITY MOVEMENT ALONG MSR: ↑ Man, CL V, CL V, CL III ↓ MEDEVAC, Rec Veh

NOTES: Black is Dirty RTE

CSS CHECK POINTS

LRP	GRID	LRP	GRID

SPECIAL INSTRUCTIONS

	BDE	CORPS
WATER POINT	BSA	
GRREG	ATP	
KIA	TR NIP	
ASP	TBD	
AIR MEDEVAC	Freq TBD	
EPW/CA	MP Plt + SPT	

DECON

TEMP & AGENT	LINK UP SITE	DECON SITE	DIRTY ROUTE
CB			Black
VX			Black

B-8

Brigade-level Mission 5 Scenario Materials: Withdrawal Followed by Defense of Positions

Section B-8 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ______

DATE: 17 DEC AM

SIMNET Plan Sheet

TRAINING AREA: ______

FREQUENCY: ______

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66	NK 431121	1700					
2B	HQ	H ~~65~~ 63	NK 438155	4500					
4A	CO/TM	A 66	NK 434121	5600					
4B	A	A 65	NK 430121	5600					
T9A		A 68	NK 432122	1800					
T4C		A 11	NK 432121	5100					
T4G		A 12	NK 431122	5100					
T6A		A 13	NK 430116	4800					
T4D		A 14	NK 431117	4800					
T43F		A 21	NK 433125	4700					
T4H		A 22	NK 434126	4700					
		23							
T4F		A 24	NK 433120	2700					
T7C		D 31	NK 390161	4400					
T3A		D 32	NK 391162	4400					
		33							
T8C		D 34	NK 432104	5100					
4C	CO/TM	B 66	NK 430153	4600					
3C	B	B 65	NK 433153	4600					
T3D		B 68	NK 430153	4900					
T5C		B 11	NK 431147	4300					
T5A		B 12	NK 432148	4300					
T9F		B 13	NK 434144	4600					
T5E		B 14	NK 433145	4600					
T5D		B 21	NK 429152	4900					
T5G		B 22	NK 430153	4900					
T8G		B 23	NK 431148	4500					
T5F		B 24	NK 430149	4500					
T7D		D 21	NK 432155	4600					
T9C		D 22	NK 433156	4600					
		33							
T8D		D 24	NK 431157	4600					

SimStaff use only: POC MT BFV SAF ST TA

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	COMM	C 66*	NK 460152	4800			TM STRIKE		
2D	C	C 65*	NK 460165	4600	3F	H36	NK 354089	5600	
T4B		C 68	NK 449162	4600	T~~?~~1D	H69	NK 377192	2500	
T6E		C 11*	NK 466152	4600	3H	C21	NK 379191	2800	
T5H		C 12	NK 467153	4600	3G	C22	NK 380194	3300	
		13			2G	C23	NK 353088	3200	
T6F		C 14*	NK 466153	4600	2H	C24	NK 345087	400	
		21*							
		22			T~~?~~2F	H56	NK 450120	4800	
		23			T~~?~~5B	H51	NK 451120	4800	
		24*			T~~?~~6B	H~~?~~41	NK 395130	4800	
					T8A	H71	NK 444161	4800	
T7E		C 31*	NK 461156	4500					
T7G		C 32	NK 462157	4500					
T10D		C 33	NK 461162	4500					
T7F		C 34*	NK 460163	4500					
2F	COMM	D 66*	NK 372131	5300					
T2C	D	D 65*	NK 436102	5500					
T3E		D68	NK 436101	5500					
T7A		D 11*	NK 371126	4500					
T3B		D 12	NK 372127	4500					
T9D		D 13	NK 432107	5300					
T2A		D 14*	NK 431108	5300					
T6C		A ~~1~~-31	NK 439130	4900					
T7H		A ~~2~~ 32	NK 440131	4900					
T9E		A ~~23~~ 33	NK 433119	3600					
T8E		A ~~24~~-34	NK 432120	3600					
T1C		B 31*	NK 430121	1400					
T8H		B 32	NK 431122	1400					
		33							
T8F		B 34*	NK 430122	1800					
T~~?~~2F	SCOUTS	H ~~7~~-91	NK 390170	0					
T2D		H ~~7~~-94	NK 320129	4800					
T3G		H ~~73~~-92	NK 363160	4800					
T3H		H 74-93	NK 299154	4800					
T4A		H 75-95	NK 332175	4800					
		76*							

ENEMY: (GENERAL)

BDE ENEMY:

HIGHER MISSION: XVIII ABC defends in sector NLT Dec 93 to defeat the 31st CAA and allow no penetration of PL Nebraska

HIGHER INTENT: Destroy 1st echelon divisions forward. Allow no penetration of PL Nebraska. VII Corps is moving East of PL Nebraska and is preparing to attack West. We need to allow no enemy penetration of PL Nebraska to allow VII Corps to prepare for their attack

TASK ORG	1 70	2 33	3 123	19	D 10			
	A B C G A 19	A B C D B 19	A B C C C 19					

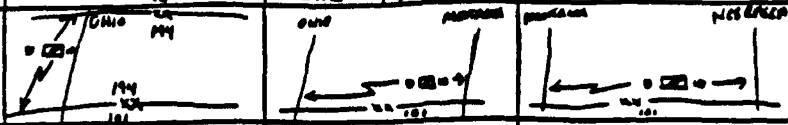
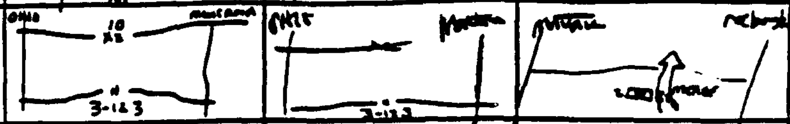
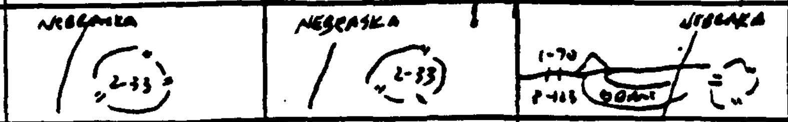
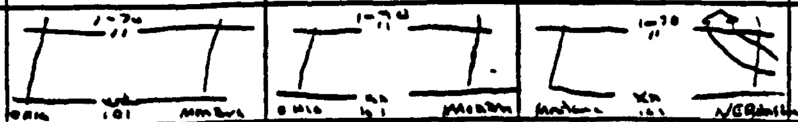
ATTACH/DETACH: 2-136 (M) OPCON to 2/101 ABN DIV (AA)
1-201 FA DS

BDE MISSION: 194th SAB defends in sector from PL Ohio to PL Nebraska NLT Dec 93 to destroy the 36th GMRD, allowing no penetration of PL Nebraska.

INTENT: I want to force the enemy to move into the northern sector where we can attrit him. I want to fight this in 3 phases. 1st phase is a tough counter Recon focused on the South to deny him any success in the southern sector. 2nd fase is to defend from PL Ohio to PL Montana in sector with 2 task forces abreast. 3d fase is a TF CATK to destroy the second echelon regiment.

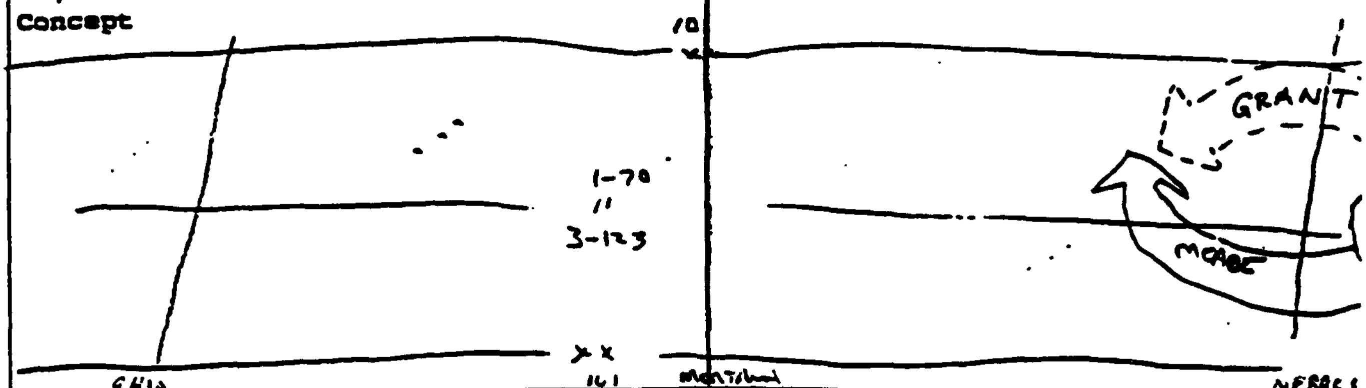
PIR:

EEFI:

ACTION/ UNIT	PHASE I Counter Recon	PHASE II Def in Sector Ohio → Montana	Defend in Sector Montana → Nebraska CATK	
D/10				
TF 1-70				
TF 2-33				
TF 3-123				
TF 2-136	OPCON	OPCON	OPCON	OPCON
PRIORITY OF FIRES	D/10	3-123	2-33	
PRIORITY OF ADA				
PRIORITY OF ENGINEER	Counter mob Survivability	Counter mobility Survivability	Counter mobility Survivability	

ADA	MOPP 2	OEG	STD TO	

Concept



CDR WITH TF	S3 WITH TF	MAIN	A/J PER S
3-123	1-70	2-33	SWITCH TI

PYRO	CHALLENGE/PASSWORD PER SOI	OFFICIAL FINK, S-

CONCEPT OF SERVICE SUPPORT

BEFORE Top off combat vehicles, replenish UBL's in AA. Priority of replacements is as TF 1-70, 2-136, 3-123, 2-33, 2-111, 19 EN. POM in order: M1, M2/M3, M109, Rec. Veh., fuel + ammo transport. Controlled sub. to unit level, minimize cannibalization. CL VII avail for D+7, use BDAR Kit. Pri. of protection is to ammo, fuel, SB's, CP's. Pri. of MVMT is to Man. units, CL III, then CL V, GI Collected w/ATP. CEB avail. after D+4 in CSA loc TBD est. Stockpiles at beginning Ammo in BP Reins.

DURING Pri. of replacements unchanged. MVMT prio. is to CL III + CL V FWD, MED + Maint Evac (Rear). has SR prior. on Commitment, LOG PAC security provided by MP PLT. Cannibalization auth @ DS Level. Pos trans to Rearm/Refuel Committed units. POM unchanged.

AFTER Reorg. priority is 1-70, 2-136, 3-123, 2-33, 1-211, 19th EN in order. Goal is 70% CE. unit rearm refit, refuel, POM remains the same. Rear MVMTS prior. is to MEDEVAC. Prep for future opns. Rear area pri. unchanged.

MAN ARM FUEL FIX MOVE PROTECTION

CSS EXECUTION MATRIX

PHASE	PTP	1-70 LRP	2-136 LRP	3-123 LRP
CALL SIGN				
TASK ORG				
I Prep	PTP 1 PTP 2 PTP 3	unit Dist BN LV	unit Dist BN LV	unit Dist BN LV
II MVMT	↓	L-5 2?458 L-2 438102	L3 435205 L4 395145	L5 392218 L6 362157
III MB	↓	↓	↓	↓
IV CA	↓	L-7	L-8	L-9

CLASS I & WATER: BSA > Active LRP

CLASS V: ATP Grid O/O

CSS PER DAY EFFECTIVE: D-

120mm APDS	30	RAP 155mm HE	40/10	.50 CAL	300
120mm HEAT	10	155mm ILLUM	10	7.62mm	60
TOW	10	155mm SMK/WP	5/5	5.56mm SAW	8
25mm AP	500	CPHD DRAGON	12 3	5.56mm	21
25mm HE	500	AT4	4	155mm RAAM	
STINGER	4	155mm DPICM	80	155mm ADAM	

CLASS III & V PRIORITY: Before 1-70, 2-136 / During ? / After 1-70, 3-...

CLASS IX: Cont. Swapping M1, M2/M3 Eng; M109 x mod; CORPS/DIV MCP: LOC TBD

MAINTENANCE PRIORITIES

TRACKS	M1	M2/M3	M109	Rec Veh
WHEELS	Fuelers	LGE Ammo		
UNIT	1-70	2-136	2-33	3-123

CSS SUPPORT MATRIX (SATELLITE)

UNIT	CLASS 1,3,5	MED EVAC	RECOVERY	
CSA Assets	✓	✓	✓	
DSA	✓	✓	✓	

BSA LOCATION: 215255

DATE	RATION CYCLE	LRP	TIME	WINDOW
D-12	C-C-T	unit Dist	O/O Coord	
D+2	C-C-T	↓	↓	↓
D+4	E-C-T	↓	↓	↓
D+6	B-C-T	↓	↓	↓

CIVIL-MILITARY OPS:

MSR

NAME	TIME EFFECTIVE:
Blue	H-10
Red	H-10
Black	O/C

PRIORITY MOVEMENT ALONG MSR: ↑ Man, CL IV, CL V, CL III ↓ MEDEVAC, Rec Evac

NOTES: Black is Dirty RTE

CSS CHECK POINTS

LRP	GRID	LRP	GRID

SPECIAL INSTRUCTIONS

	BDE	CORPS
WATER POINT	BSA	
GREGG	ATP	
KIA	TR NIA	
ASP	TBD	
AIR MEDEVAC	Fwd TBD	
EPW/CA	MP Plt + SPT	

DECON

TEMP & AGENT	LINK UP SITE	DECON SITE	DIRTY ROUTE
GB			Black
VX			Black

B-9

Brigade-level Mission 6 Scenario Materials: Change of Mission to Defend New Positions

Section B-9 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

UNIT: ____________ MISSION 6

SIMNET Plan Sheet

DATE: ____________ 18 DEC AM

TRAINING AREA: ____________

FREQUENCY: ____________

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66*	NK 470235	0					
2B	HQ	H ~~65*~~ 63	NK 467235	0					
4A	CO/TM	A 66*	NK 470250	0					
4B		A 65*	NK 467250	0					
T9A	A	A 68	NK 473250	0					
T4C		A 11*	NK 469260	0					
T4G		A 12	NK 470261	0					
		13							
T4D		A 14*	NK 471260	0					
T3F		A 21*	NK 459255	0					
T4H		A 22	NK 460256	0					
		23							
T4F		A 24*	NK 461255	0					
T7C		D 31*	NK 479257	0					
		32							
		33							
T8C		D 34*	NK 481257	0					
4C	CO/TM	B 66*	NK 450235	4800					
3C		B 65*	NK 450233	4800					
T3D	B	B 68	NK 450237	4800					
T5C		B 11*	NK 441234	4800					
T5A		B 12	NK 442235	4800					
		13							
T5E		B 14*	NK 441236	4800					
T5D		B 21*	NK 448244	4800					
T5G		B 22	NK 449245	4800					
		23							
T5F		B 24*	NK 449246	4800					
T7D		D ~~31*~~ 21	NK 445224	4800					
		32							
		33							
T8D		D ~~34*~~ 24	NK 445226	4800					

(Site Staff Use only)

POC: M1: BFV: SAF: ST: TA:

UNIT:

DATE:

SIMNET Plan Sheet

TRAINING AREA:

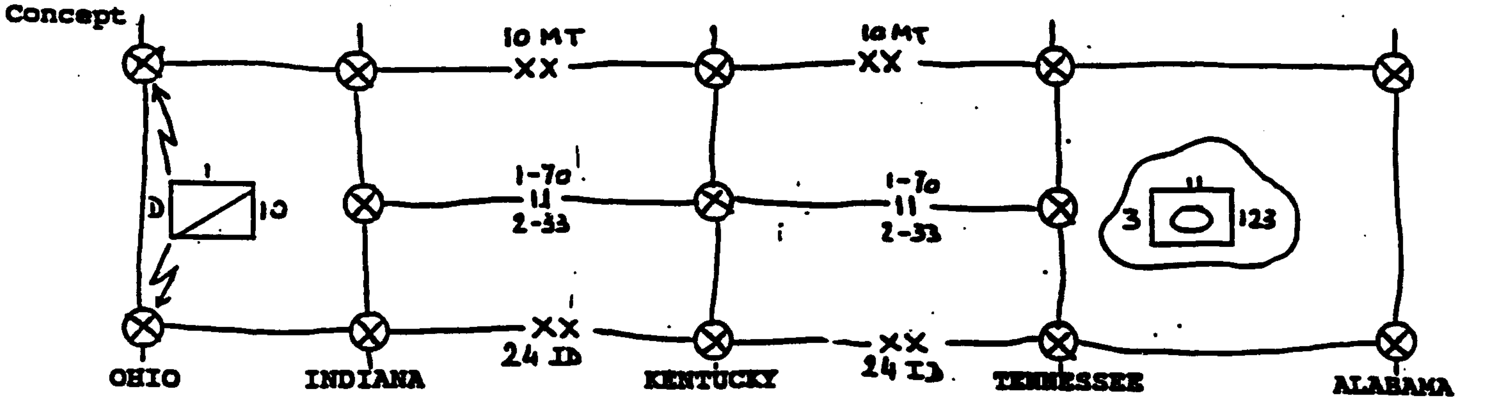
FREQUENCY:

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	CO/TM	C 66*	NK 470220	3200			TM STRIKE		
2D	C	C 65*	NK 472220	3200	3F	H36	NK 465261	5600	
T4B		C 68	NK 468220	3200	T1D	H69	NK 467261	5600	
T6E		C 11*	NK 48 213	3200	3H	C21	NK 458265	5600	
T5H		C 12	NK 482214	3200	3G	C22	NK 458263	5600	
T7G		C 13	NK 480212		2G	C23	NK 462265	5600	
T6F		C 14*	NK 479213	3200	2H	C24	NK 460265	5600	
		21*							
		22			T2F	H56	NK 465241	0	
		23			T5B	H51	NK 464239	0	
		24*			T6B	H41	NK 475246	0	
					T8A	H71	NK 469233	0	
T7E		C 31*	NK 461213	3200					
		32							
		33							
T7F		C 34*	NK 459213	3200					
2F	CO/TM	D 66*	NK 485235	1600					
T2C	D	D 65*	NK 485237	1600					
T3E		D 68	NK 485233	1600					
T7A		D 11*	NK 495236	1600					
		12							
		13							
T2A		D 14*	NK 495234	1600					
T6C		A 31	NK 490243	1600					
T7H		A 32	NK 491244	1600					
		23							
T8E		A 34	NK 490245	1600					
T1C		B 31*	NK 490228	1600					
T8H		B 32	NK 491229	1600					
		33							
T8F		B 34*	NK 490226	1600					
T2E	SCOUTS	H 91	NK 454274	5600					
T2D		H 94	NK 456276	5600					
T3G		H 92	NK 455274	5600					
T3H		H 93	NK 456274	5600					
T4A		H 95	NK 455276	5600					
		76*							

ACTION/ UNIT	Recon/ Counterrecon	MBA Fight Defeat of 1st echelon Regt	Defeat of 2nd echelon Regt	Fwd passage of 101st ABD (AA) and 1st Cav Div	
D/10	D 1 10 Screen Destroy recon	Block enemy access through Granite Pass	Screen South Fl	Screen South Fl	
TF 1-70	Defend in sector	destroy 1st Ech	destroy 2nd Ech	assist Fwd passage of 101st ABD and 1st Cav	
TF 2-33	Defend in sector	destroy 1st Ech	destroy 2nd Ech	assist Fwd passage of 101st ABD and 1st Cav	
TF 3-123	Bde Res	Bde Res	Counterattack priority NORTH	assist Fwd passage of 101st ABD and 1st Cav	
PRIORITY OF FIRES	D-10, 1-70, 2-33	1-70, 2-33, D-10, 3-123	1-70, 2-33, 3-123, D-10	1-70, 2-33, 3-123, D-10	
PRIORITY OF ADA	1) Mnvr } 2) BSA } 3) FA } ———	———	———	———>	
PRIORITY OF ENGINEER	C/S/M	C/S/M	C/S/M	M/S/C	

ADA	MOPP	OEG	STD TO	

Concept



CDR WITH TF 1-70	S3 WITH TF 2-33	MAIN 480273	A/J PER SOI SWITCH TIME 0/0

PYRO	CHALLENGE/PASSWORD PER SOI	OFFICIAL FINK, MAJ, S-3

UNIT: ____________

DATE: ____________

SIMNET Plan Sheet

TRAINING AREA: ____________

FREQUENCY: ____________

PART II. COMBAT SUPPORT ELEMENTS

FIRE SUPPORT	LOCATION	AZIMUTH	AMMO	CSR	ADMINISTRATIVE NOTES
TYPE					
BATTERY #1	NK 505275	4800			36 ROUNDS is basic load of the M109
BATTERY #2	NK 505285	4800			Howitzer. The following ammo is
BATTERY #3	NK 505295	4800			available: PD. PROX. RAAM. ADAM.
MORTAR PLATOON	NK 475245	5600			88 ROUNDS is basic load of the M106.

CLOSE AIR SUPPORT		
AVAILABLE SORTIES:	PREPLANNED SORTIES:	

COMBAT ENGINEER ASSETS	LOCATION	ADMINISTRATIVE NOTES
Combat Engineer Company		Assets include: 3 Engineer Platoons (4 ea M113); 3 ea M128 GEMSS; 4 ea M57; and 4 ea M58A1 MICLIC.

PART III. COMBAT SERVICE SUPPORT ELEMENTS

DSA/BSA and TRAINS	LOCATION	SUPPORT PLATOON LOCATION	or COMPANY TRAINS	UNIT	LOCATION
CL III SUPPLY POINT				A	
CL III DISTRIBUTION POINT				B	
CL V SUPPLY POINT				C	
CL V DISTRIBUTION POINT				D	
UMCP					

PART IV. COMMAND AND CONTROL

TYPE:	LOCATION
BATTALION TACTICAL OPERATIONS CENTER	
ADMIN/LOGISTICS OPERATION CENTER	

ADDITIONAL NOTES/SPECIAL REQUIREMENTS

ENEMY: (GENERAL) Currently the 31st CAA is conducting a deliberate atta against elements of the XVIII ABC with the 36 GMRD and the 22nd TD as 1st echelon divisions. At present it is believed that the 31st CAA is 80% strength.

BDE ENEMY: The 194th SAB is currently facing the lead regiments of 36 GMRD. All source intelligence reports indications of a aggressive counterrecon screen within the 194th SAB's sector. This may be an ind cation of the enemy's intanded main effort.

HIGHER MISSION: XVIII Corps occupies assigned sector NLT Dec 93 defends in sector NLT Dec , to defeat the 31st CAA and prepare to attack West in support of the USJTF counterattack.
HIGHER INTENT: Defeat three 1st echelon Divisions forward of PL TENNESS and then attack to block and defeat lead regiments.

TASK ORG	1 70	2 33	3 123	19	3 10			
	△ △ △ □ A B C D A 19 A/77 3 A 3-61	△ △ △ □ A B C G B 19	△ △ △ △ A B C D C 19					

ATTACH/DETACH: 2-136 (M) OPCON to 2/101 Abn Div (AA)
1-201 FA D/S

BDE MISSION: 194th SAB occupies and defends in sector NLT Dec 93 destroy the 36th GMRD. On order assist forward passage of lines of 101 ABD (AA) and 1st Cav Div.
INTENT: I want the Bde to fight an aggressive recon/counterrecon battle deny the enemy knowledge of our main defenses. D/10 will fix and destr the enemy's recon and CRP's and identify as much as possible of the FSE's. The 1st echelon regiments must be destroyed forward of PL KENTUCKY. We will mass overwhelming fires to complete destruction of the 2nd echelon regiments forward of PL TENNESSEE. TF 3-123 AR will co duct counterattacks to assist the forward TF's. We will allow no enem penetration beyond PL ALABAMA. Our endstate will be the destruction o 36th GMRD and our TF's defending along PL Tennessee at a strength of minimum 70%.

PIR:
1. Where are the 1st echelon regiments of the 36th MRD?
2. Where are the enemy's counterattack forces, where and when will attack?
3. Will, when and where will the enemy employ chemical weapons?

EEFI:

B-10

Brigade-level Mission 7 Scenario Materials: Attack to Seize Objectives

Section B-10 contains the following materials:

Combat Elements Starting Locations
Combat Support Elements Starting Locations
Brigade-level FRAGO

SIMNET Plan Sheet

DATE: LOGEX 19 DEC 93 AM

TRAINING AREA: ______
FREQUENCY: ______

PART I. COMBAT ELEMENTS

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
3B	HQ	H 66	NK 541231	4800					
2B	HQ	H 63	NK 562231	1600					
2H		A 67	NK 559227	4400					
4A	CO/TM	A 66	NK 551224	4000					
4B	A	A 65	NK 551225	4000					
T9A		A 68	NK 552223	4000					
T4C		A 11	NK 547217	4800					
		12							
		13							
T4D		A 14	NK 547218	4800					
T4A		A 71	NK 559229	4000					
T[illegible]		A 21	NK 553211	4000					
		22							
		23							
T4F		A 24	NK 552212	4000					
T4G		H 75	NK 560215	4800					
T7C		D 31	NK 545226	4400					
		32							
		33							
T8C		D 34	NK 545227	4800					
3H		B 67	NK 557245	5600					
4C	CO/TM	B 66	NK 551245	5600					
3C	B	B 65	NK 551243	5600					
T3D		B 68	NK 552247	5600					
T5C		B 11	NK 543245	5600					
		12							
		13							
T5E		B 14	NK 543246	5600					
T5A		B 71	NK 557247	5600					
T5D		B 21	NK 544235	4800					
		22							
		23							
T5F		B 24	NK 544237	4800					
T5G		H 72	NK 562236	4800					
T7D		D 21	NK 549253	0000					
		32							
		33							
T8D		D 24	NK 551253	0000					

(SimSite use only)

POC: MI: BFV: SAF: ST: TA:

DATE:

TRAINING AREA:

FREQUENCY:

SIM	UNIT	BUMPER #	LOCATION	AZIMUTH	ALIGNMENT	FUEL	AMMO	MAINT	REMARKS
2C	COMM	C 66	NK 576245	800			TM STRIKE		
2D	C	C 65	NK 575246	800	3F	H36	NK 535221	4800	
T4B		C 68	NK 576243	800	T[illegible]1D	H69	NK 535219	4800	
T6E		C 11	NK 580251	800	T10D [illegible]	C21	NK 528218	4800	
		12			T6B [illegible]	C22	NK519218	4800	
		13			T4H [illegible]	C23	NK531218	4800	
T6F		C 14	NK 581 250	800	T9E [illegible]	C24	NK530218	4800	
3G		C 67	NK 570242	800					
		21							
		22			T[illegible]2F	H56	NK 562254	800	
		23			T[illegible]5B	H51	NK562255	800	
		24			T[illegible]5H	H[illegible]41	NK563232	4000	
T6A		C 71	NK 570240	800	T8A	H71	NK565229	4000	
T7E		C 31	NK 582241	1600					
		32							
		33							
T7F		C 34	NK 581 239	1600					
T7G		H73	NK 564214	4800					
2F	COMM	D 66	NK 571226	2400					
T2C		D 65	NK 573 227	2400					
T3E	D	D68	NK 570225	2400					
T7A		D 11	NK 577217	2400					
		12							
		13							
T2A		D 14	NK 576216	2400					
2G		D67	NK 569231	2400					
T6C		A 2-31	NK 585225	2400					
		22							
		[illegible]							
T8E		A 2-34	NK 584224	2400					
T7H		D 71	NK 569230	2400					
T1C		B 31	NK 570212	3200					
		32							
		33							
T8F		B 34	NK 569212	3200					
T8H		H74	NK 566 216	4800					
T[illegible]2E	SCOUTS	H 2-91	NK 515217	4800					
T2D		H 2-94	NK 515220	4800					
		73							
		74							
		75							
		76							

194 SAB FRAGO # 93-[redacted] DTG Dec 93 COPY OF

ENEMY: (GENERAL) Currently the remnants of the lead divisions of 31st CAA are preparing hasty defensive positions in an attempt to reorganize and reconstitute their forces after the initial attack. These forces are believed to be greatly attrited and waiting for reinforcements.

BDE ENEMY: The 194th SAB will be facing 2nd echelon regiments of the 22nd TD in the defense. All source intelligence reports of large heavy tank units in assembly areas west of Obj Lee. It is believed that these unit constitute the 22nd TD's divisional reserve.

HIGHER MISSION: XVIII ABC attacks NLT Dec to defeat the 22 TD and to secure terrain vic PL Bull.

HIGHER INTENT: Following our recent successful defense and the losses th enemy has taken, the has fallen back to regroup and reinforce. My intent is to capitalize on their weakness, push on their weakened force and not allow them any rest. I want a controlled attack but I want to keep pressing. I expect sporadic and understrength units. We need to exploit success but not lose contact with adjacent units.

TASK ORG	1 70	2 33	3 123	2 126	1 201	19	D 10	
	A B C D A 19	A B C G B 19	A B C D	C B E A B C 19				

ATTACH/DETACH:

BDE MISSION: 194th SAB attacks NLT 190900 Dec to seize Obj Lee. Be prepared to contimu to attack to the west.

INTENT: The key to our success is the destruction of the enemy at Obj TFs who are not the main effort must be prepared to assume the atta Once on Obj LEE, we must reorganize quickly to defeat a possible en counterattack. Our endstate will be two TFs controlling Obj LEE, wit two TFs in reserve and D/10 screening in the North, and no unit below 70% strength.

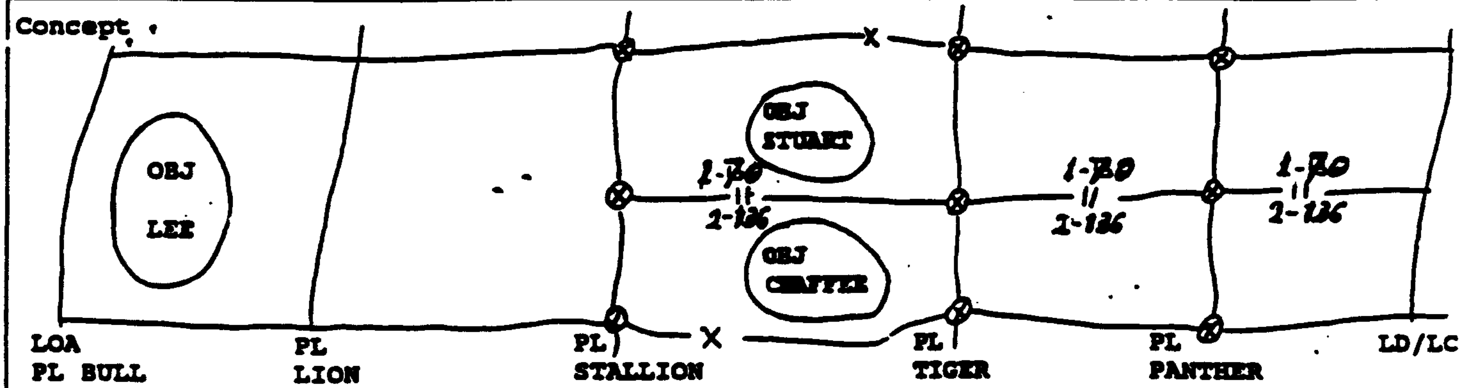
PIR: 1. Where are the 1st Echelon Regiments of the 22nd TR?
2. Where are the enemy's counterattack forces, where and when will he attack?
3. Obstacles.
4. Enemy MOPP level

EEFI: No change

ACTION/ UNIT	Attack to Obj Stuart and Chaffee	Attack to Obj Lee	Consolidate and Reorganize	Forward passage 101st ABD
D/10	Recon	Recon	Screen along PL	Assist FPOL 101st ABD
TF 1-70	Attack ~~south~~ north in Bde sector	Attack ~~south~~ north in Bde sector	Obj LEE, orient south-southwest	Assist FPOL 101st ABD
TF 2-33	Follow behind TF 2-136	Follow behind TF 2-136	Bde Res	Assist FPOL 101st ABD
TF 3-123	Follow behind TF 1-70	Follow behind TF 1-70	Bde TCP	Assist FPOL 101st ABD
TF 2-136	Attack ~~north~~ south in Bde sector	Attack north in Bde sector	Obj LEE, orient north-northwest	
PRIORITY OF FIRES	D/10, 1-70, 2-136, 2-33, 3-123 —	————————	————————	————————
PRIORITY OF ADA	MNVR, BSA, FA, C2 —	————————	————————	————————
PRIORITY OF ENGINEER	M/C/S ————	————————	————————>	S/M/C

ADA YELLOW TIGHT	MOPP	OEG	STD TO	

Concept



CDR WITH TF 1-70	S3 WITH TF 2-136	MAIN	A/J PER SOI SWITCH TIME 0/0
PYRO	CHALLENGE/PASSWORD PER SOI		OFFICIAL FINK, S-3

APPENDIX C

DEFINITIONS OF AUTOMATED MEASURES OF PERFORMANCE (MOPs)

HIE MOP LIST ORGANIZED by ISSUE

Issue d1.4. Did mixed digital C2/voice C2 problems occur?

d1.4.1: Number of voice report transmissions.
d1.4.2: Number of digital report transmissions.

Issue d2. Does digitized battle command improve tempo?

d2.1: Time to execute operations.
d2.3: Time to reach objectives.
d2.4: Unit dispersion distance.
d2.5: Time out of sector.

Issue d3. Does digitized battle command improve lethality?

d3.1.1: Average manned BLUFOR miss range.
d3.1.2: Average manned BLUFOR hit range.
d3.2.1.1: Number of manned systems fighting in the battle.
d3.2.1.2: Proportion of manned systems fighting in the battle.
d3.2.2.1: Number of unmanned BLUFOR systems fighting in the battle.
d3.2.2.2: Proportion of unmanned BLUFOR systems fighting in the battle.
d3.2.3.1: Number of all BLUFOR systems fighting in the battle.
d3.2.3.2: Proportion of all BLUFOR systems fighting in the battle
d3.2.4.1: Number of OPFOR systems fighting in the battle.
d3.2.4.2: Proportion of OPFOR systems fighting in the battle.
d3.3: Total number of calls for fire. [Captured by Measures d1.4.1 and d1.4.2].
d3.5: Average range at which enemy was destroyed.
d3.8.1.1: Number of enemy kills over time.
d3.8.1.2: Proportion of enemy kills over time.
d3.8.2: Time to kill the enemy
d3.9: Loss exchange ratio.
d3.10: System exchange ratio.

Issue d4: Does digitized battle command improve survivability?

d4.1: Loss exchange ratio. [Same as measure d3.9].
d4.2: System exchange ratio. [Same as measure d3.10].

Issue d6: Does digitized battle command extend the lethal range/battlespace of the BN/TF?

d6.1.1: Maximum range the enemy was missed.
d6.1.2: Maximum range the enemy was hit.
d6.2: Maximum range the enemy was killed.

Issue d7: Does digitised battle command improve the ability to mass forces?

d7.1.1 Total number of systems in the fight. [Same as d3.2.3.1].
d7.1.2: Total proportion of systems in the fight. [Same as d3.2.3.2].

Issue d8: Does digitised battle command improve situational awareness and reduce incidence of fratricide?

d8.1.1: Number of blue systems engaged by BLUFOR.
d8.1.2: Distance between blue systems engaged by BLUFOR.
d8.2.1: Number of blue systems killed by BLUFOR.
d8.2.2: Distance between blue systems killed by BLUFOR.

Issue 12.1. What type of information management does digitization require?

d1.4.1: Number of voice report transmissions.
d1.4.2: Number of digital report transmissions.

HIE MOP OPERATIONAL DEFINITIONS
ORGANIZED by ISSUE

Note: Voice data specifications are included as a reference for government data collection/reduction activities since BDM is not tasked with conducting voice playback transcriptions.

Issue d1.4. Did mixed digital C2/voice C2 problems occur?

Measure d1.4.1: Number of voice report transmissions.

Operational Definition: The total number of all (unique and nonunique) voice reports transmitted by manned vehicles by report type (i.e., CONTACT, SITREP, SPOT, CFF) on all radio nets: BN CMD, A CMD, B CMD, C CMD, D CMD, H CMD, and TM STRIKE. Number per vehicle.

Applicable Scenarios: ALL
Level of Measurement: Vehicle
Data Source: Voice Playback

Measure d1.4.2: Number of digital report transmissions.

Operational Definition: The total number of all (unique and nonunique) digital reports transmitted by manned vehicles by report type (i.e., CONTACT, SITREP, SPOT, CFF) on all radio nets: BN CMD, A CMD, B CMD, C CMD, D CMD, H CMD, and TM STRIKE. Number per vehicle.

Applicable Scenarios: ALL
Level of Measurement: Vehicle
Data Source: DataLogger

Issue d2. Does digitized battle command improve tempo?

Measure d2.1: Time to execute operations.

Operational Definition: The elapsed time, in minutes, from the transmission of REDCON-1 by the battalion commander to ENDEX (start and end to be flagged by PVD operator for DCA computation).

Applicable Scenarios: ALL
Level of Measurement: Task Force
Data Source: DataLogger (requires flag input)
Exceptions: Excludes periods of equipment breakdowns and admin breaks not related to execution.

Measure d2.3: Time to reach objectives.

Operational Definition: The elapsed time, in minutes, from the crossing of the LD by each company's center of mass vehicle to the time when each company's center of mass vehicle reaches its objective. Events to be flagged by PVD operator.

Applicable Scenarios: ATK
Level of Measurement: Company
Data Source: DataLogger (requires flag input)
Exceptions: C Company

Measure d2.4: Unit dispersion distance.

Operational Definition: The distance, in meters, from the vehicle closest to the center of mass for each company to the most distant vehicle of the same unit. Measurement for ATK and MTC will be taken when the last vehicle crosses the LD for each company and battalion. Measurement for defense will be taken when companies are set on BPs for company and battalion. Events to be flagged by PVD operator for DCA computation.

Applicable Scenarios: All
Level of Measurement: Task Force and Company
Data Source: DataLogger (requires flag input)

Measure d2.5: Time out of sector.

Operational Definition: The elapsed time, in minutes, from a manned vehicle traveling beyond established Task Force boundaries to the time the same vehicle reenters the Task Force boundaries. Events to be flagged by PVD operator for DCA computation. Calculate cumulative time across separate incidents.

Applicable Scenarios: All
Level of Measurement: Vehicle
Data Source: DataLogger (requires flag input)

Issue d3. Does digitized battle command improve lethality?

Measure d3.1.1: Average manned BLUFOR miss range.

Operational Definition: The distance, in meters, from a firing manned vehicle to the OPFOR vehicle missed by the round fired; average per vehicle. Uses standard DCA intended target algorithm.

Applicable Scenarios: All
Level of Measurement: Vehicle
Data Source: DataLogger

Measure d3.1.2: Average manned BLUFOR hit range.

Operational Definition: The distance, in meters, from a firing manned vehicle to the OPFOR vehicle hit by the round fired; average per vehicle.

Applicable Scenarios: All
Level of Measurement: Vehicle
Data Source: DataLogger

Measure d3.2.1.1 Number of manned systems fighting in the battle.

Operational Definition: For each company and manned system type (M1, M2,), the total number of manned vehicles firing at least one round of ammunition.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: DataLogger

Measure d3.2.1.2 Proportion of manned systems fighting in the battle.

Operational Definition: For each company and manned system type (M1, M2), the total number of manned vehicles firing at least one round of ammunition divided by the total number of manned BLUFOR vehicles for that system type available during a given mission.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: Battlemaster (# avail), DataLogger

Measure d3.2.2.1: Number of unmanned BLUFOR systems fighting in the battle.

Operational Definition: For each company and unmanned BLUFOR system type (M1, M2, M1A2), the number of unmanned BLUFOR vehicles firing at least one round of ammunition.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: DataLogger

Measure d3.2.2.2: Proportion of unmanned BLUFOR systems fighting in the battle.

Operational Definition: For each company and unmanned BLUFOR system type (M1, M2), the number of unmanned BLUFOR vehicles firing at least one round of ammunition divided by the total number of unmanned BLUFOR vehicles for that system type available during a given mission.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: Battlemaster (#avail), DataLogger

Measure d.3.2.3.1: Number of all BLUFOR systems fighting in the battle.

Operational Definition: For each company and BLUFOR system type (M1, M1A2, M2), the number of BLUFOR vehicles firing at least one round of ammunition.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: DataLogger

Measure d.3.2.3.2: Proportion of all BLUFOR systems fighting in the battle.

Operational Definition: For each company and BLUFOR system type (M1, M2), the number of BLUFOR vehicles firing at least one round of ammunition divided by the total number of BLUFOR vehicles for that system type available during a given mission.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: Battlemaster (#avail), DataLogger

Measure d3.2.4.1 Number of OPFOR systems fighting in the battle.

Operational Definition: For each company and OPFOR system type (T72,BMP), the number of OPFOR vehicles firing at least one round of ammunition.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: DataLogger

Measure d3.2.4.2 Proportion of OPFOR systems fighting in the battle.

Operational Definition: For each company and OPFOR system type (T72, BMP), the number of OPFOR vehicles firing at least one round of ammunition divided by total number of OPFOR vehicles for that system type available during a given mission.

Applicable Scenarios: All
Level of Measurement: Company and System Type
Data Source: Battlemaster (#avail), DataLogger

Measure d3.3: Total number of calls for fire. [Captured by Measures d1.4.1 and d1.4.2].

Measure d3.5: Average range at which enemy was destroyed.

Operational Definition: For each kill type, the distance, in meters, from a firing manned vehicle to the OPFOR vehicle killed; average per vehicle.

Applicable Scenarios: All
Level of Measurement: Vehicle
Data Source: DataLogger

Measure d3.8.1.1: Number of enemy kills over time.

Operational Definition: For each kill type, the total number of OPFOR kills, sampled at five minute intervals. Measurement begins with first OPFOR killed and ends with last OPFOR killed. Calculate independent counts per intervals.

Applicable Scenarios: All
Level of Measurement: Task Force
Data Source: DataLogger

Measure d3.8.1.2: Proportion of enemy kills over time.

Operational Definition: For each kill type, the total number of OPFOR kills divided by total OPFOR available at the onset of each mission, sampled at five minute intervals. Measurement begins with first OPFOR killed and ends with last OPFOR killed. Calculate independent counts per intervals.

Applicable Scenarios: All
Level of Measurement: Task Force
Data Source: Battlemaster (#avail), DataLogger

<u>Measure d3.8.2</u>: Time to kill the enemy

Operational Definition: For each kill type, the elapsed time from the first OPFOR kill to the last OPFOR kill.

Applicable Scenarios: All
Level of Measurement: Task Force
Data Source: DataLogger

<u>Measure d3.9</u>: Loss exchange ratio.

Operational Definition: For each kill type, the total number of OPFOR elements killed divided by the total number of BLUFOR vehicles killed by OPFOR elements. Includes direct and indirect fire kills.

Applicable Scenarios: All
Level of Measurement: Task Force
Data Source: DataLogger

<u>Measure d3.10</u>: System exchange ratio.

Operational Definition: For each kill type, the total number of OPFOR kills divided by total number of like BLUFOR kills by system type. System types: M1/T-72, M2/BMP. Includes direct and indirect fire kills.

Applicable Scenarios: All
Level of Measurement: System Type
Data Source: DataLogger

Issue d4: Does digitized battle command improve survivability?

<u>Measure d4.1</u>: Loss exchange ratio. [Same as measure d3.9].

<u>Measure d4.2</u>: System exchange ratio. [Same as measure d3.10].

Issue d6: Does digitized battle command extend the lethal range/battlespace of the BN/TF?

<u>Measure d6.1.1</u>: Maximum range the enemy was missed.

Operational Definition: For each company, the maximum distance, in meters, from a firing manned vehicle to the OPFOR vehicle missed by the round fired. Uses standard DCA intended target algorithm.

Applicable Scenarios: All
Level of Measurement: Company
Data Source: DataLogger

Measure d6.1.2: Maximum range the enemy was hit.

Operational Definition: For each company, the maximum distance, in meters, from a firing manned vehicle to the OPFOR vehicle hit by the round fired.

Applicable Scenarios: All
Level of Measurement: Company
Data Source: DataLogger

Measure d6.2: Maximum range the enemy was killed.

Operational Definition: For each kill type and for each company, the distance, in meters, from a firing manned vehicle to the OPFOR vehicle killed.

Applicable Scenarios: All
Level of Measurement: Company
Data Source: DataLogger

Issue d7: Does digitized battle command improve the ability to mass forces?

Measure d7.1.1: Total number of systems in the fight. [Same as d3.2.3.1].

Measure d7.1.2: Total proportion of systems in the fight. [Same as d3.2.3.2].

Issue d8: Does digitized battle command improve situational awareness and reduce incidence of fratricide?

Measure d8.1.1: Number of blue systems engaged by BLUFOR.

Operational Definition: For each BLUFOR system type (M1, M2) the number of times manned BLUFOR vehicles hit another BLUFOR vehicle.

Applicable Scenarios: All
Level of Measurement: System Type
Data Source: DataLogger

Measure d8.1.2: Distance between blue systems engaged by BLUFOR.

Operational Definition: For each BLUFOR system type, the distance (in meters) between a manned BLUFOR vehicle and the BLUFOR vehicle it has hit.

Applicable Scenarios: All
Level of Measurement: System Type
Data Source: DataLogger

Measure d8.2.1: Number of blue systems killed by BLUFOR.

Operational Definition: For each kill type, the number of times manned BLUFOR vehicles killed another BLUFOR vehicle by BLUFOR system type (M1, M2).

Applicable Scenarios: All
Level of Measurement: System Type
Data Source: DataLogger

Measure d8.2.2: Distance between blue systems killed by BLUFOR.

Operational Definition: For each kill type, the distance (in meters) between a manned BLUFOR vehicle and the BLUFOR vehicle it has killed by BLUFOR system type (M1, M2).

Applicable Scenarios: All
Level of Measurement: System Type
Data Source: DataLogger

Issue 12.1. What type of information management does digitization require?

Measure d1.4.1: Number of voice report transmissions (specified earlier).

Measure d1.4.2: Number of digital report transmissions. (specified earlier).

APPENDIX D

EVENT FLAG LOGS

December 13, 1993

PLAN VIEW DISPLAY (PVD) OPERATOR LOG

HORIZONTAL INTEGRATION SIMULATION EFFORT

TASK FORCE EXERCISES -- **DEFENSE**

Date:________________ DataLogger File:__________

Type of Exercise:____________

PVD Operator:__________________________

Position	**Sim**	**Call Sign**	**Vehicle ID**
Bn Cmdr	___	______	________
Bn S-3	___	______	________
CTCP	___	______	________
Mortar	___	______	________
Eng Cdr	___	______	________
Eng Plt Ldr	___	______	________
Eng Plt Sgt	___	______	________
ADA	___	______	________
Scout Plt Ldr	___	______	________
Scout Plt Sgt	___	______	________

DataLogger TURNED ON AT TIME: ___:___:___ FLAG: ___

PVD Operator Log -- Task Force Exercises -- DEFENSE -- Page 2

Position	Sim	Call Sign	Vehicle ID
A Co Cmdr	_	____	______
A Co XO	_	____	______
A 1st Plt Ldr	_	____	______
A 1st Plt Sgt	_	____	______
A 2nd Plt Ldr	_	____	______
A 2nd Plt Sgt	_	____	______
A 3rd Plt Ldr	_	____	______
A 3rd Plt Sgt	_	____	______
B Co Cmdr	_	____	______
B Co XO	_	____	______
B 1st Plt Ldr	_	____	______
B 1st Plt Sgt	_	____	______
B 2nd Plt Ldr	_	____	______
B 2nd Plt Sgt	_	____	______
B 3rd Plt Ldr	_	____	______
B 3rd Plt Sgt	_	____	______
C Co Cmdr	_	____	______
C Co XO	_	____	______
C 1st Plt Ldr	_	____	______
C 1st Plt Sgt	_	____	______
C 2nd Plt Ldr	_	____	______
C 2nd Plt Sgt	_	____	______
C 3rd Plt Ldr	_	____	______
D Co Cmdr	_	____	______
D Co XO	_	____	______
D 1st Plt Ldr	_	____	______
D 1st Plt Sgt	_	____	______
D 2nd Plt Ldr	_	____	______
D 2nd Plt Sgt	_	____	______
D 3rd Plt Ldr	_	____	______
D 3rd Plt Sgt	_	____	______

DEFENSE #1:

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
___	___	Bn Cmdr reports REDCON 1		
___	___	A Co crosses LD [Flag when COM sim of A Co is set in BP ________]	___	___
___	___	B Co crosses LD [Flag when COM sim of B Co is set in BP ________]	___	___
___	___	C Co crosses LD [Flag when COM sim of C Co is set in BP ________]	___	___
___	___	D Co crosses LD [Flag when COM sim of D Co is set in BP ________]	___	___
___	___	All Cos cross LD [Flag when COM sim of Bn is set in BP ________]	___	___
___	___	ENDEX (END OF DEFENSE #1)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	___	___	___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___	___	___	___

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: BREAKDOWNS (note who, what, start & stop); HALT IN EXERCISE (note why, start & stop); EQUIPMENT PROBLEMS; MISCELLANEOUS NOTEWORTHY EVENTS.

FLAG	TIME	PROBLEM
___	___	______________________________
___	___	______________________________
___	___	______________________________
___	___	______________________________

ADDITIONAL EVENTS TO FLAG [An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG	TIME	EVENT DESCRIPTION
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________
___	_____	______________________________

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG	TIME	EVENT
___	_____	Bde OPORD received
___	_____	Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___	_____	Task Force OPORD briefing to Co Cmdrs COMPLETED
___	_____	Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs

DEFENSE #2:

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
__	___	Bn Cmdr reports REDCON 1		
__	___	A Co crosses LD [Flag when COM sim of A Co is set in BP ____________]	___	_____
__	___	B Co crosses LD [Flag when COM sim of B Co is set in BP ____________]	___	_____
__	___	C Co crosses LD [Flag when COM sim of C Co is set in BP ____________]	___	_____
__	___	D Co crosses LD [Flag when COM sim of D Co is set in BP ____________]	___	_____
__	___	All Cos cross LD [Flag when COM sim of Bn is set in BP ____________]	___	_____
__	___	ENDEX (END OF DEFENSE #1)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	_____	_____	___	_____	_____	___	_____	_____	___	_____	_____
___	_____	_____	___	_____	_____	___	_____	_____	___	_____	_____

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: BREAKDOWNS (note who, what, start & stop); HALT IN EXERCISE (note why, start & stop); EQUIPMENT PROBLEMS; MISCELLANEOUS NOTEWORTHY EVENTS.

FLAG	TIME	PROBLEM
___	_____	____
___	_____	____
___	_____	____
___	_____	____

ADDITIONAL EVENTS TO FLAG [An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG TIME EVENT DESCRIPTION

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG TIME EVENT

___ _____ Bde OPORD received

___ _____ Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___ _____ Task Force OPORD briefing to Co Cmdrs **COMPLETED**

___ _____ Co Cmdrs **HAVE COMPLETED** their orders briefing to their Plt Ldrs

December 13, 1993

PLAN VIEW DISPLAY (PVD) OPERATOR LOG

HORIZONTAL INTEGRATION SIMULATION EFFORT

TASK FORCE EXERCISES -- MOVEMENT TO CONTACT

Date:__________________ DataLogger File:__________

Type of Exercise:_____________

PVD Operator:____________________________

Position	Sim	Call Sign	Vehicle ID
Bn Cmdr	__	______	________
Bn S-3	__	______	________
CTCP	__	______	________
Mortar	__	______	________
Eng Cdr	__	______	________
Eng Plt Ldr	__	______	________
Eng Plt Sgt	__	______	________
ADA	__	______	________
Scout Plt Ldr	__	______	________
Scout Plt Sgt	__	______	________

DataLogger TURNED ON AT TIME: ___:___:___ FLAG: ____

PVD Operator Log -- Task Force Exercises -- MOVEMENT TO CONTACT -- Page 2

Position	Sim	Call Sign	Vehicle ID
A Co Cmdr	___	______	________
A Co XO	___	______	________
A 1st Plt Ldr	___	______	________
A 1st Plt Sgt	___	______	________
A 2nd Plt Ldr	___	______	________
A 2nd Plt Sgt	___	______	________
A 3rd Plt Ldr	___	______	________
A 3rd Plt Sgt	___	______	________
B Co Cmdr	___	______	________
B Co XO	___	______	________
B 1st Plt Ldr	___	______	________
B 1st Plt Sgt	___	______	________
B 2nd Plt Ldr	___	______	________
B 2nd Plt Sgt	___	______	________
B 3rd Plt Ldr	___	______	________
B 3rd Plt Sgt	___	______	________
C Co Cmdr	___	______	________
C Co XO	___	______	________
C 1st Plt Ldr	___	______	________
C 1st Plt Sgt	___	______	________
C 2nd Plt Ldr	___	______	________
C 2nd Plt Sgt	___	______	________
C 3rd Plt Ldr	___	______	________
D Co Cmdr	___	______	________
D Co XO	___	______	________
D 1st Plt Ldr	___	______	________
D 1st Plt Sgt	___	______	________
D 2nd Plt Ldr	___	______	________
D 2nd Plt Sgt	___	______	________
D 3rd Plt Ldr	___	______	________
D 3rd Plt Sgt	___	______	________

MOVEMENT TO CONTACT #1

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
_	___	Bn Cmdr reports REDCON 1		
_	___	A Co crosses LD [Flag when COM sim of A Co completely crosses LD ______]	___	____
_	___	B Co crosses LD [Flag when COM sim of B Co completely crosses LD ______]	___	____
_	___	C Co crosses LD [Flag when COM sim of C Co completely crosses LD ______]	___	____
_	___	D Co crosses LD [Flag when COM sim of D Co completely crosses LD ______]	___	____
_	___	All Cos cross LD [Flag when COM sim of Bn completely crosses LD ______]	___	____
_	___	ENDEX (END OF MOVEMENT TO CONTACT #1)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	____	____	___	____	____	___	____	____	___	____	____
___	____	____	___	____	____	___	____	____	___	____	____

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: BREAKDOWNS (note who, what, start & stop); HALT IN EXERCISE (note why, start & stop); EQUIPMENT PROBLEMS; MISCELLANEOUS NOTEWORTHY EVENTS.

FLAG	TIME	PROBLEM
___	____	____________________________
___	____	____________________________
___	____	____________________________
___	____	____________________________

ADDITIONAL EVENTS TO FLAG [An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG TIME EVENT DESCRIPTION

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

___ _____ ______________________________

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG TIME EVENT

___ _____ Bde OPORD received

___ _____ Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___ _____ Task Force OPORD briefing to Co Cmdrs COMPLETED

___ _____ Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs

MOVEMENT TO CONTACT #2

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
__	___	Bn Cmdr reports REDCON 1		
__	___	A Co crosses LD [Flag when COM sim of A Co completely crosses LD ______]	___	____
__	___	B Co crosses LD [Flag when COM sim of B Co completely crosses LD ______]	___	____
__	___	C Co crosses LD [Flag when COM sim of C Co completely crosses LD ______]	___	____
__	___	D Co crosses LD [Flag when COM sim of D Co completely crosses LD ______]	___	____
__	___	All Cos cross LD [Flag when COM sim of Bn completely crosses LD ______]	___	____
__	___	ENDEX (END OF MOVEMENT TO CONTACT #2)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	____	____	___	____	____	___	____	____	___	____	____
___	____	____	___	____	____	___	____	____	___	____	____

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: BREAKDOWNS (note who, what, start & stop); HALT IN EXERCISE (note why, start & stop); EQUIPMENT PROBLEMS; MISCELLANEOUS NOTEWORTHY EVENTS.

FLAG	TIME	PROBLEM
___	____	______________________________
___	____	______________________________
___	____	______________________________
___	____	______________________________

ADDITIONAL EVENTS TO FLAG [An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG	TIME	EVENT DESCRIPTION
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________
___	_____	____________________

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG	TIME	EVENT
___	_____	Bde OPORD received
___	_____	Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___ _____ Task Force OPORD briefing to Co Cmdrs COMPLETED

___ _____ Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs

December 13, 1993

PLAN VIEW DISPLAY (PVD) OPERATOR LOG

HORIZONTAL INTEGRATION SIMULATION EFFORT

TASK FORCE EXERCISES -- ATTACK

Date:________________ DataLogger File:_________

Type of Exercise:____________

PVD Operator:__________________________

Position	Sim	Call Sign	Vehicle ID
Bn Cmdr	__	_____	_______
Bn S-3	__	_____	_______
CTCP	__	_____	_______
Mortar	__	_____	_______
Eng Cdr	__	_____	_______
Eng Plt Ldr	__	_____	_______
Eng Plt Sgt	__	_____	_______
ADA	__	_____	_______
Scout Plt Ldr	__	_____	_______
Scout Plt Sgt	__	_____	_______

DataLogger TURNED ON AT TIME: ___:___:___ FLAG: ____

PVD Operator Log -- Task Force Exercises -- ATTACK -- Page 2

Position	Sim	Call Sign	Vehicle ID
A Co Cmdr			
A Co XO			
A 1st Plt Ldr			
A 1st Plt Sgt			
A 2nd Plt Ldr			
A 2nd Plt Sgt			
A 3rd Plt Ldr			
A 3rd Plt Sgt			
B Co Cmdr			
B Co XO			
B 1st Plt Ldr			
B 1st Plt Sgt			
B 2nd Plt Ldr			
B 2nd Plt Sgt			
B 3rd Plt Ldr			
B 3rd Plt Sgt			
C Co Cmdr			
C Co XO			
C 1st Plt Ldr			
C 1st Plt Sgt			
C 2nd Plt Ldr			
C 2nd Plt Sgt			
C 3rd Plt Ldr			
D Co Cmdr			
D Co XO			
D 1st Plt Ldr			
D 1st Plt Sgt			
D 2nd Plt Ldr			
D 2nd Plt Sgt			
D 3rd Plt Ldr			
D 3rd Plt Sgt			

ATTACK #1:

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
__	___	Bn Cmdr reports REDCON 1		
__	___	A Co crosses LD [Flag when COM sim of A Co completely crosses LD ________]	___	____
__	___	B Co crosses LD [Flag when COM sim of B Co completely crosses LD] ________]	___	____
__	___	C Co crosses LD [Flag when COM sim of C Co completely crosses LD] ________]	___	____
__	___	D Co crosses LD [Flag when COM sim of D Co completely crosses LD ______]	___	____
__	___	All Cos cross LD [Flag when COM sim of Bn completely crosses LD ________]	___	____
__	___	A Co reaches OBJ [Flag when COM sim of A Co is inside OBJ ________]	___	____
__	___	B Co reaches OBJ [Flag when COM sim of B Co is inside OBJ ________]	___	____
__	___	C Co reaches OBJ [Flag when COM sim of B Co is inside OBJ ________]	___	____
__	___	D Co reaches OBJ [Flag when COM sim of D Co is inside OBJ ________]	___	____
__	___	All Cos reach OBJ [Flag when COM sim of Bn is inside OBJ ________]	___	____
__	___	ENDEX (END OF ATTACK #1)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	____	____	___	____	____	___	____	____	___	____	____
___	____	____	___	____	____	___	____	____	___	____	____

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: <u>BREAKDOWNS</u> (note who, what, start & stop); <u>HALT IN EXERCISE</u> (note why, start & stop); <u>EQUIPMENT PROBLEMS</u>; <u>MISCELLANEOUS NOTEWORTHY EVENTS</u>.

FLAG	TIME	PROBLEM
___	____	____
___	____	____

ADDITIONAL EVENTS TO FLAG **[An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]**

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG	TIME	EVENT DESCRIPTION
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________
___	_____	__________

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG	TIME	EVENT
___	_____	Bde OPORD received
___	_____	Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___	_____	Task Force OPORD briefing to Co Cmdrs COMPLETED
___	_____	Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs

ATTACK #2:

EVENT NOTED FROM PVD			EVENT REPORTED FROM SIM	
FLAG	TIME	EVENT	FLAG	TIME
__	___	Bn Cmdr reports REDCON 1		
__	___	A Co crosses LD [Flag when COM sim of A Co completely crosses LD ________]	___	_____
__	___	B Co crosses LD [Flag when COM sim of B Co completely crosses LD] ________]	___	_____
__	___	C Co crosses LD [Flag when COM sim of C Co completely crosses LD] ________]	___	_____
__	___	D Co crosses LD [Flag when COM sim of D Co completely crosses LD ______]	___	_____
__	___	All Cos cross LD [Flag when COM sim of Bn completely crosses LD ________]	___	_____
__	___	A Co reaches OBJ [Flag when COM sim of A Co is inside OBJ ________]	___	_____
__	___	B Co reaches OBJ [Flag when COM sim of B Co is inside OBJ ________]	___	_____
__	___	C Co reaches OBJ [Flag when COM sim of B Co is inside OBJ ________]	___	_____
__	___	D Co reaches OBJ [Flag when COM sim of D Co is inside OBJ ________]	___	_____
__	___	All Cos reach OBJ [Flag when COM sim of Bn is inside OBJ ________]	___	_____
__	___	ENDEX (END OF ATTACK #2)		

FLAG ANY SIM(s) OUT OF THEIR SECTOR; THEN FLAG WHEN THEY RETURN TO THEIR SECTOR:

Out Of Sector			Return To Sector			Out Of Sector			Return To Sector		
Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim	Flag	Time	Sim
___	_____	_____	___	_____	_____	___	_____	_____	___	_____	_____
___	_____	_____	___	_____	_____	___	_____	_____	___	_____	_____

CAUSE OF RETURN TO SECTOR: (self/other sims/ECR) (Circle which applies and describe how sim returned to sector).

____

____

OTHER OCCURRENCES TO FLAG & RECORD: BREAKDOWNS (note who, what, start & stop); HALT IN EXERCISE (note why, start & stop); EQUIPMENT PROBLEMS; MISCELLANEOUS NOTEWORTHY EVENTS.

FLAG	TIME	PROBLEM
___	_____	____
___	_____	____

ADDITIONAL EVENTS TO FLAG [An SME at the Stealth will call over the CB (admin net, channel 6) and indicate when to throw flags for these events]

UPON INDICATION FROM THE SME, flag when a BLUFOR element reports enemy observation; flag again when the BLUFOR element carries out the SME's subsequent order.

FLAG TIME EVENT DESCRIPTION

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

___ _____ ____

UPON INDICATION FROM THE SME, flag when the Bde OPORD is received; flag again when the Task Force OPORD is completed.

FLAG TIME EVENT

___ _____ Bde OPORD received

___ _____ Task Force OPORD completed

UPON INDICATION FROM THE SME, flag when the Task Force OPORD briefing to the Co Cmdrs has been COMPLETED; flag again when the Co Cmdrs HAVE COMPLETED their orders briefing to their Plt Ldrs.

___ _____ Task Force OPORD briefing to Co Cmdrs **COMPLETED**

___ _____ Co Cmdrs **HAVE COMPLETED** their orders briefing to their Plt Ldrs

APPENDIX E

IVIS ROUTING TABLES

Battalion Command Network

CONTACT REPORTS (Point)

DESTS / SOURCES	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR		X	X		X		X						
S3	X		X		X		X						
TOC S3	X	X		X	X		X		X				
CTCP S1/S4		X	X										
CO CDR	X	X	X				X						
CO XO	X	X	X				X						
SCT PLT LDR	X	X	X		X								
FSO		X	X						X				
MORT PLT LDR		X	X					X					
ENG CDR	X	X	X										
ADA CDR	X	X	X										
S2	X	X		X	X								
BN XO	X		X										

Company Command Network

CONTACT REPORTS (Point)

DESTS / SOURCES	CO CMDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR		X		X	X	
CO XO	X			X	X	
CO 1SG	X	X				
FIST	X	X				
PLT LDR	X	X		X	X	
PLT SGT	X	X				

Platoon Command Network

CONTACT REPORTS (Point)

DESTS / SOURCES	PLT LDR	PLT SGT	WM 1	WM 2
PLT LDR		X	X	X
PLT SGT.	X		X	X
WM 1	X	X		X
WM 2	X	X	X	

• NA: No Acknowledgment Received from Destination Address

Battalion Command Network

FIRE RQT REPORTS (Point)

DESTS / SOURCES	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR			X					X					
S3			X					X					
TOC S3									X				
CTCP S1/S4			X					X					
CO CDR			X					X					
CO XO			X					X					
SCT PLT LDR			X					X					
FSO									X				
MORT PLT LDR			X					X					
ENG CDR			X					X					
ADA CDR			X					X					
S2													
BN XO			X					X					

Company Command Network

FIRE RQT AND CAS RQT (Point)

DESTS / SOURCES	CO CDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR				X		
CO XO				X		
CO 1SG	X	X				
FIST						
PLT LDR	X	X				
PLT SGT	X	X				

Platoon Command Network

FIRE RQT REPORTS (Point)

DESTS / SOURCES	PLT LDR	PLT SGT	WM 1	WM 2
PLT LDR				
PLT SGT	X			
WM 1	X			
WM 2	X			

* NA: No Acknowledgment Received from Destination Address

Battalion Command Network

SIT REPORTS (broadcast to All) *

SOURCES \ DESTS	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR		NA	NA	NA									
S3	NA		NA	NA									
TOC S3	NA	NA		NA									
CTCP S1/S4	NA	NA	NA										
CO CDR		NA	NA	NA									
CO XO		NA	NA	NA									
SCT PLT LDR			NA										
FSO			NA										
MORT PLT LDR			NA										
ENG CDR			NA										
ADA CDR			NA										
S2			NA										
BN XO			NA										

Company Command Network

SITREP REPORTS (Broadcast to All) *

SOURCES \ DESTS	CO CDR	CO XO	CO 1SG	FIST	PLT LDR*	PLT SGT
CO CDR		NA	NA		NA	
CO XO			NA		NA	
CO 1SG		NA			NA	
FIST		NA			NA	
PLT LDR	NA	NA			NA	
PLT SGT			NA		NA	

Platoon Command Network

BROADCAST TO ALL

* NA: No Acknowledgment Received from Destination Address

Battalion Command Network

OPERATIONS OVERLAYS AND UPDATES (Point)

SOURCES \ DESTS	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR		X	X		X		X						
S3	X		X										
TOC S3	X	X		X	X		X						
CTCP S1/S4			X										X
CO CDR			X										
CO XO			X										
SCT PLT LDR			X										
FSO													
MORT PLT LDR													
ENG CDR													
ADA CDR													
S2													
BN XO													

Company Command Network

OPERATIONS OVERLAYS AND UPDATES (Point)

SOURCES \ DESTS	CO CDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR		X	X	X	X	
CO XO	X		X	X	X	
CO 1SG						
FIST						
PLT LDR						
PLT SGT						

Platoon Command Network

OPERATIONS OVERLAYS AND UPDATES (Point)

SOURCES \ DESTS	PLT LDR	PLT SGT	WM 1	WM 2
PLT LDR		X	X	X
PLT SGT				
WM 1				
WM 2				

* NA: No Acknowledgment Received from Destination Address

Battalion Command Network

ENEMY OVERLAYS AND UPDATES (Broadcast to All) *

DESTS / SOURCES	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR													
S3													
TOC S3													
CTCP S1/S4													
CO CDR													
CO XO													
SCT PLT LDR													
FSO													
MORT PLT LDR													
ENG CDR													
ADA CDR													
S2	NA	NA		NA	NA		NA						
BN XO													

Company Command Command

ENEMY OVERLAYS AND UPDATES (Broadcast to All) *

DESTS / SOURCES	CO CDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR		NA	NA	NA	NA	
CO XO	NA			NA	NA	
CO 1SG						
FIST						
PLT LDR						
PLT SGT						

Platoon Command Network

BROADCAST TO ALL

* NA: No Acknowledgment Received from Destination Address

Battalion Command Network

FIRE SUPPORT OVERLAYS AND UPDATES (Broadcast to All) *

SOURCES \ DESTS	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR													
S3													
TOC S3													
CTCP S1/S4													
CO CDR													
CO XO													
SCT PLT LDR													
FSO													
MORT PLT LDR	NA	NA	NA	NA	NA								
ENG CDR								NA					
ADA CDR													
S2								NA					
BN XO													

Company Command Network

FIRE SUPPORT OVERLAYS UPDATES (Broadcast to All) *

SOURCES \ DESTS	CO CDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR		NA	NA	NA	NA	
CO XO	NA			NA	NA	
CO 1SG						
FIST	NA	NA			NA	
PLT LDR						
PLT SGT						

Platoon Command Network

BROADCAST TO ALL

* NA: No Acknowledgment Received from Destination Address

Battalion Command Network

OBSTACLE OVERLAYS (broadcast to All) *

DESTS / SOURCES	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR													
S3			NA							NA			
TOC S3	NA	NA		NA									
CTCP S1/S4			NA							NA			
CO CDR													
CO XO													
SCT PLT LDR													
FSO													
MORT PLT LDR													
ENG CDR	NA	NA	NA	NA	NA								
ADA CDR													
S2													
BN XO													

OBSTACLE UPDATES (Broadcast to All) *

DESTS / SOURCES	BN CMDR	S3	TOC S3	CTCP S1/S4	CO CMDR	CO XO	SCT PLT LDR	FSO	MORT PLT LDR	ENG CMDR	ADA CMDR	S2	BN XO
BN CDR		NA	NA							NA			
S3													
TOC S3													
CTCP S1/S4													
CO CDR			NA							NA			
CO XO			NA										
SCT PLT LDR													
FSO													
MORT PLT LDR													
ENG CDR	NA	NA	NA	NA	NA								
ADA CDR													
S2													
BN XO													

Company Command Network

OBSTACLE OVERLAYS AND UPDATES(Broadcast to All) *

DESTS / SOURCES	CO CDR	CO XO	CO 1SG	FIST	PLT LDR	PLT SGT
CO CDR		NA	NA	NA	NA	
CO XO	NA			NA	NA	
CO 1SG						
FIST						
PLT LDR						
PLT SGT						

Platoon Command

BROADCAST TO ALL

* NA: No Acknowledgment Received from Destination Address

APPENDIX F

ITRANS DOCUMENTATION

OASIS-LR9302-2 12 Jan 94

M1A2 / CVCC Translation Specification
for the
InterVehicular Information System Translator
(ITRANS)

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Table of Contents

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1. General Issues

The purpose of the InterVehicular Information Systems Translator (ITRANS) is to provide seamless IVIS communication between the CVCC IVIS system and the M1A2 IVIS Systems. The M1A2 systems will not know if the vehicles it sees are M1A2 IVIS equipped or CVCC IVIS equipped and the CVCC systems will not know if the vehicles it sees are CVCC IVIS equipped or M1A2 IVIS equipped.

The ITRANS views the communication world with two types of networks: one for CVCC and one for M1A2. Each system will understand only one of the two types of report formats. The ITRANS represents the systems which are not on the same logical communication network, that is, it represents M1A2 systems on the CVCC network, and represents CVCC systems on the M1A2 network. Therefore, the ITRANS must provide all the status and handshaking data that a native system would.

This document provides a user perspective on the translations performed by the ITRANS.

Section 1 contains general overview information and describes handling of specific issues.

Section 2 contains the translations between reports.

Section 3 contains the translations between overlays.

Section 4 contains an explanation the translation table convention used in this document.

1.1. Call Signs

M1A2 call signs are five characters long with the format specified in the figure 1. CVCC call signs are not rigidly formatted. The conversions are described below.

Letter	Digit	Letter	Digit	Digit

Figure 1: M1A2 IVIS Call Sign Format

1.1.1 CVCC to M1A2 Call Sign Translation

When CVCC Status PDUs are received an M1A2 call sign is created for each vehicle which has not been mentioned in a previous Status PDU. Figure 2 shows the duty position dependent method that is used.

Duty Position		Call Sign				
		Letter	Digit*	Letter	Digit	Digit
Battalion	Commander	A	0..9	Y	0	6
	XO	A	0..9	Y	0	5
	FSO	A	0..9	Y	0	5
	S1	A	0..9	Y	0	5
	S2	A	0..9	Y	0	5
	S3	A	0..9	Y	0	5
	S4	A	0..9	Y	0	5
Company	Commander	A	0..9	Company	6	6
	XO	A	0..9	Company	0	5
Platoon	Leader	A	0..9	Company	Platoon	1
	Sergeant	A	0..9	Company	Platoon	4
	Wingman 1	A	0..9	Company	Platoon	2
	Wingman 2	A	0..9	Company	Platoon	3

Figure 2: CVCC to M1A2 Call Sign Creation

*The first digit of the call sign is created somewhat randomly by the following method: A counter is started at 0 each time a status PDU is received. For each new vehicle, the rightmost digit of this counter is used as this first digit of the call sign. If the call sign created has been used, the digit is incremented until a unique call sign is created.

1.1.2 CVCC to M1A2 Tank Number Creation

Each M1A2 system also has a unique tank ID. For the M1A2s, this is the password that was entered when the Commander's Integrated Display was powered on. For CVCC systems, this value is created by concatenating an M and a unique number. The unique number is simply a count of each CVCC vehicle encountered, padded with leading zeros to make it a 5 digit number.

1.1.3 M1A2 to CVCC Call Sign Translation

The native M1A2 IVIS call sign is used.

The M1A2 IVIS call sign is parsed to obtain echelon information. The M1A2 Simulator Systems do not transmit all of the echelon information that the tank commander has entered, but this information is required to uniquely identify an entity in an exercise for CVCC communications. Therefore, a convention was adopted which encodes this information in the call sign. In order for ITRANS to operate properly, the call signs selected must conform to the rules shown in figure 3. The question marks may be substituted with any letter or digit as specified. Figure 4 shows some sample call signs for specified duty positions.

Duty Position	Call Sign Format Requirement				
	Letter	Digit	Letter	Digit	Digit
Battalion	?	?	H	0-5 or 7-9	?
Platoon assigned to Battalion	?	?	H	6	?
Company	?	?	A - F	5 - 9	?
Platoon	?	?	A - F	1 - 4	?

Figure 3: Call Sign Assignment Convention for ITRANS

Duty Position	Sample Call Sign
Battalion Commander	M1H24
Scout Platoon Leader	M1H64
Company A Commander	M1A54
Company D, 4th Platoon Leader	M1D44

Figure 4: Sample Call Signs

1.2. Duty Positions

In some cases, CVCC and M1A2 duty positions do not directly match. The mapping from CVCC to M1A2 is shown in figure 5. Section 2.2 contains an explanation of the formatting convention used in figure 5.

CVCC Duty Position		M1A2 Duty Position	
Brigade	Commander	Undefined	
	XO	Undefined	
	FSO	Undefined	
	S1	Undefined	
	S2	Undefined	
	S3	Undefined	
	S4	Undefined	
Battalion	Commander	Battalion	Commander
	XO		XO
	FSO		FSO
	S2		S2
	S3		S3
	S4 S1		CTCP
	Sit Disp		Undefined
Company	Commander	Company	Commander
	XO		XO FIST 1st SGT
Platoon	Leader	Platoon	Leader Scout PL LDR Mortar PL LDR SPT PL LDR ADA CDR EGR CDR MED PL LDR UCMP CMBT SRV M BMO
	Sergeant		Sergeant
	Wingman 1		Wingman 1
	Wingman 2		Wingman 2

Figure 5: CVCC to M1A2 Duty Position Conversion

1.3. Position Reports

The CVCC systems use database coordinates to communicate vehicle positions, whereas the M1A2 uses MGRS world coordinates. The database coordinates are used to create a UTM location. This UTM location is converted to an MGRS location by adding a spheroid and grid zone designator (two digits and a letter). The spheroid and grid zone designator are stored in the configuration file (discussed in section 1.5). This method of location conversion is not completely accurate but has been shown to be adequate in experiments.

The ITRANS system ensures that position reports are sent to M1A2 systems for each CVCC system on the network. ITRANS watches the movement of each CVCC vehicle and keeps a timer for each so that it may send position reports every 15 minutes or 100 meters of vehicle movement.

The CVCC systems expect to receive status updates every 5 seconds from every vehicle on the network. The ITRANS ensures that these are sent out for the M1A2 vehicles. These status updates include position information. The position information is based on the database coordinates of the vehicle on the simulated battlefield. The CVCC systems are not sent M1A2 position reports, nor are they given any position data transmitted in those reports.

CVCC systems see all vehicles in an exercise. This is accomplished by forwarding the status reports (including position) up and down the command chain. This is contrary to the M1A2 approach where only vehicles on a particular command networks are visible. Again, ITRANS provides seamless communication: the CVCC systems are told all vehicle locations and the M1A2 systems are told only the positions of vehicles on their command networks.

1.4 Report Routing

In the CVCC world all reports are broadcast on a communication network. Each level of command is assigned its own command network, and all reports are received by every system on that network. Instead, the M1A2 system routes most reports based upon their type and the duty positions of the sender and receivers. A few report types specify broadcast sending, instead of the point to point report routing. When a report is broadcast, all simulators in which the radios are set to the parameters of the source will receive the report.

To maintain the seamless communication between these systems reports sent on the M1A2 network are directed according to the routing tables and reports sent on the CVCC network are broadcast on a command network.

1.5 Configuration File

The configuration file is divided up into four parts: the location of the exercise, the mapping of radio parameters to each CVCC command network, the M1A2 routing tables, and preloaded CVCC vehicles. An overview of each part is provided below.

1.4.1 Exercise Location

As described in section 1.3 Position Reports, the spheroid and grid zone designator that are used in the conversion from UTM to MGRS are stored in the configuration file.

1.4.2 Radio Parameters to CVCC Command Network Mapping

The M1A2 systems use radio settings to establish the command networks, whereas the CVCC systems use echelon information to establish or define the command networks. The radio parameter to CVCC

command network mapping includes an entry for every command network that is to be used in an exercise. This entry identifies both the echelon and the radio settings for the command network.

For example, the A Company, 2nd Platoon command network might use radio A, channel 2, frequency hopping, 4800 data rate, COMSEC variable 1, plain text, and have time delay off. The configuration file entry for this network would look like the following:

```
radio    A      2      FH      4800    1    PT    Off
net      Bn 1   Co A   Plt 2   Irr
```

1.4.3 Routing Tables

The routing tables are read from the configuration file. Each report has its own entry. This entry may specify broadcast or a table of duty positions. The table of duty positions has the following format:

```
route   route-table-name (
                sender ( primary primary ... )
                       ( alternate alternate ... )
                sender ( primary primary ... )
                       ( alternate alternate ... )
                       )
```

Where the route-table-name may be any one of
contact, spot, cff, sit, overlay_ops, overlay_enemy, overlay_fso, overlay_ops1*

* The overlay_ops routing table is used for both the obstacle and the operations 1 overlays. The overlay_ops1 is used for the operations 2 overlay. This is confusing and should probably be changed.

The sender, primary, and alternate are duty positions, which may be any one of
BnCO, BnXO, BnS4, BnS3, BnS3TOC, BnS2, BnS1, BnFSO
CoCO, CoXO, Co1SG, CoFist
PL, PS, PW1, PW2
SctPL, MortPL, EngCO, AdaPL, SptPL, MedPL, UMCP, BMO, CSM

When a report is to be routed the duty position of the sender is looked up in the routing table specified by the type of the report. This lookup yields two lists: a list of primary receivers and a list of alternate receivers. Anyone currently on the command network whose duty position is in the list of primary destinations will receive the report. If there are no primary receivers of a report, the alternate list is checked in the same way.

1.4.4 Preloaded CVCC Vehicles

Several of the Battalion TOC positions do not have vehicle simulations. Therefore, status messages are not sent for these positions. The ITRANS does not see these entities so they are preloaded into ITRANS. The battalion S2 entry would look like the following:

```
cvcc_vehicle    BnS2
cvcc_network    Bn 1 Irr Irr Irr Irr
```

2. Reports

The reports from both the CVCC and M1A2 systems are shown in figure 6. The translation and direction of translation is shown in the center column. The Call For Fire, Contact, Situation, and Spot are translated in both directions. The Adjust Fire is translated in to an M1A2 Call For Fire Report, but an Adjust Fire can not be initiated from the M1A2 side of the ITRANS. The other reports are not translated.

CVCC Report	Translation	M1A2 IVIS Report
Adjust Fire	->	Call For Fire
Call For Fire	<->	Call For Fire
Contact	<->	Contact
Shell	none	
Situation	<->	Situation
Spot	<->	Spot
Intel	none	
Free Text	none	
NBC	none	
	none	MedEvac Air
	none	MedEvac Ground

Figure 6: CVCC to M1A2 IVIS Report Mapping

An M1A2 IVIS Contact or Spot report may have a Call For Fire report appended to it. When this occurs, the ITRANS generates a CVCC Contact or Spot report and an additional CVCC Call For Fire report.

2.1 Report Field Translations

The sections and tables below show the translation between M1A2 and CVCC report formats. The leftmost column contains the M1A2 report fields. The rightmost column contains the CVCC report fields. If fields from each of the two reports are on the same line of a table, there is a translation between them. In such cases, the middle column or columns describe the translation. If a report field does not have a corresponding field in the other format, the field will be on a line by itself. In these cases, the middle column describes how the field is filled in. Section 2.2 contains the translations referenced in the middle columns.

2.1.1. Call For Fire Report

M1A2 Report Field	M1A2<-CVCC	M1A2->CVCC	CVCC Report Field
Time	System Time Stamp		Time
Location			Target Location
		Sender's Location is Copied from the Status PDUs	Observer Location
Type	See Object Type Detailed Translation	See Threat Type Translation	Type
Size			Size
		Not Filled	Concentration Number
Fire Type	"Immediate Suppression"		

Figure 7: Call For Fire Report Translation

The adjust fire report is translated into an M1A2 call for fire report. The new location is transmitted and the threat type is specified as none.

An adjust fire message can not be sent from an M1A2 system to a CVCC system.

2.1.2. Contact Report

M1A2 Report Field	M1A2<-CVCC	M1A2->CVCC	CVCC Report Field
Time	System Time Stamp		Time
Location			Location
		Not Filled	Heading
Type	See Threat Type Translation [1 of 2 translated]		Type [2]
Size	1		
Fire	"None"		

Figure 8: Contact Report Translation

2.1.3. Situation Report

M1A2 Report Field	M1A2<-CVCC	M1A2->CVCC	CVCC Report Field
Time	System Time Stamp		Time
Enemy Activity	See Enemy Activity Translation		Enemy Activity Type
		Not Filled	Enemy Activity Level
Friendly Locations [9]	From Status PDUs		
		From Friendly Locations	Start FLOT
		From Friendly Locations	End FLOT
Tactical	See Tactical Translation		Own Intent
Vehicles Authorized	Not Filled		
Vehicles On Hand	Not Filled		
Personnel Authorized	Not Filled		
Personnel On Hand	From Status PDUs		
SABOT	From Status PDUs		
HEAT	From Status PDUs		
MPAT	Not Filled		
STAFF	Not Filled		
Smoke Grenade	Not Filled		
COAX	From Status PDUs		
50 Caliber	Not Filled		
Fuel	From Status PDUs, See Figure 10		
		Not Filled	Critical Shortage Ammo
		Not Filled	Critical Shortage Equipment
		Not Filled	Critical Shortage Fuel

Figure 9: Situation Report Translation

Fuel Level	Status Code
0-25%	Red
25-50%	Green
50-75%	Amber
75-100%	Black

Figure 10: Fuel Level Conversion

2.1.4. Spot Report

M1A2 Report Field	M1A2<-CVCC	M1A2->CVCC	CVCC Report Field
Time	System Time Stamp		Time
Location			Location
Type [4]	See Threat Type Translation [2 of 4 translated]		Type [2]
Size [4]	2 of 4 translated		Number [2]
		Not Filled	Damaged
		Not Filled	Destroyed
Fire Type	"None"		
Friendly Action	See Enemy Activity Translation		Enemy Activity
Activity	See Friendly Activity Translation		Own Activity

Figure 11: Spot Report Translation

2.2 Enumeration Type Translations

The following examples are given to clarify the translation tables presented below. Figure 12 shows a translation in which one M1A2 value is translated to one CVCC value, and the same CVCC value is translated back into an M1A2 value.

M1A2	CVCC
1	A

Figure 12: One to One Translation Table Entry

The M1A2 value 1 will be translated into CVCC A. 1 -> A
The CVCC value A will be translated into M1A2 1. A -> 1

Figure 13 shows a translation in which there are multiple CVCC values representing one M1A2 value. It is not possible to send B, C, D, or E from M1A2 to CVCC.

M1A2	CVCC
1	A
	B
	C
	D
	E

Figure 13: One to Many Translation Table Entry

The M1A2 value 1 will be translated into CVCC A. 1 -> A
The CVCC value A will be translated into M1A2 1. A -> 1

The CVCC value B will be translated into M1A2 1.	B	->	1
The CVCC value C will be translated into M1A2 1.	C	->	1
The CVCC value D will be translated into M1A2 1.	D	->	1
The CVCC value E will be translated into M1A2 1.	E	->	1

Figure 14 shows a translation in which there are multiple M1A2 values representing one CVCC value. It is not possible to send 2, 3, 4, or 5, from CVCC to M1A2.

M1A2	CVCC
1	A
2	
3	
4	
5	

Figure 14: Many to One Translation Table Entry

The M1A2 value 1 will be translated into CVCC A.	1	->	A
The M1A2 value 2 will be translated into CVCC A.	2	->	A
The M1A2 value 3 will be translated into CVCC A.	3	->	A
The M1A2 value 4 will be translated into CVCC A.	4	->	A
The M1A2 value 5 will be translated into CVCC A.	5	->	A
The CVCC value A will be translated into M1A2 1.	A	->	1

2.3.1 Enemy Activity Translation

The enemy activity translation is used in the Situation and Spot reports for both CVCC and M1A2. Figure 15 shows the mapping between the two enumerations.

M1A2 Enemy Activity	CVCC Activity
None	Unknown
	No Change
Defending	Defend
Attacking	Attack
	Air Attack
	Fire
	Ground Attack
Withdrawing	Withdraw
Screening	Delay
Reconing	Recon

Figure 15: Enemy Activity Translation

2.3.2 Tactical Translation

The tactical translation is used in the Situation report for both CVCC and M1A2. Figure 16 shows the mapping between the two enumerations.

M1A2 Tactical	CVCC Activity
None	Unknown
	No Change
Defend	Defend
Attack	Attack
	Air Attack
	Fire
	Ground Attack
Withdraw	Withdraw
Relief	Delay
Move	Recon

Figure 16: Tactical Translation

2.3.3 Friendly Activity Translation

The friendly activity translation is used in the Spot report for both CVCC and M1A2. Figure 17 shows the mapping between the two enumerations.

M1A2 Friendly Activity	CVCC Activity
None	*see note below
	Unknown
Continue	No Change
	Air Attack
	Attack
	Fire
	Ground Attack
	Defend
	Delay
	Withdraw
Observe	Recon

Figure 17: Friendly Activity Translation

- The M1A2 "None" is translated to the CVCC "No Change",
  The CVCC "Unknown" is translated to the M1A2 "None",

2.3.4 Threat Type Translation

Threat types are specified in three reports: Contact, Call For Fire, and Spot. Several different translations are required because of the level of detail allowed in each. Figure 18 is used in creating all three CVCC reports from M1A2 reports. Figure 19 defines the translation used in creating M1A2 Contact reports from CVCC reports. Figure 20 defines the translation used in creating M1A2 Call For Fire and Spot reports from CVCC reports.

M1A2 Threat Type	CVCC Object Type
None	Unknown
Aircraft	Fix Wing Aircraft
Aircraft Flogger	
Aircraft Havoc	Helicopter
Aircraft Hind	
Aircraft Hip	
Artillery	Artillery
Artillery SP	
Artillery Towed	
APC	Personnel Carrier
APC BMP	
APC BDRM	
APC BTR	
Tank	Tank
Tank T55	
Tank T60	
Tank T72	
Tank T80	
Tank NATO	
Tank FST 1	Truck
Tank FST 2	
Other	Unknown
Other Bunker	
Other ZSU23	Truck
Other SA9 13	
Other Infantry	Troop

Figure 18: M1A2 Threat Type to CVCC Object Type Mapping

CVCC Object Type	M1A2 Threat Type
Unknown	None
Fix Wing Aircraft	Aircraft
Helicopter	
Artillery	Artillery
Mortar	
Personnel Carrier	APC
Truck	
C2	
Mech	
Scout	
Support	
Tank	Tank
ATGM	Other
Troop	
Unknown Obstacle	
Abati Obstacle	
Blown Bridge Obstacle	
Mine Field Obstacle	
Tank Ditch	
Nuclear Attack	
Biological Attack	
Chemical Attack	
NBC Observe Location	
Artillery Shell	
FLOT	

Figure 19: CVCC Object Type Mapping to M1A2 Threat Type

CVCC Object Type	M1A2 Threat Type
Unknown	None
Fix Wing Aircraft	Aircraft Flogger
Helicopter	Aircraft Hind
Artillery	Artillery
Mortar	
Personnel Carrier	APC BMP
Truck	APC
C2	
Mech	
Scout	
Support	
Friendly Tank	Tank NATO
Target Tank	Tank T72
Troop	Other Infantry
ATGM	Other
Unknown Obstacle	
Abati Obstacle	
Blown Bridge Obstacle	
Mine Field Obstacle	
Tank Ditch	
Nuclear Attack	
Biological Attack	
Chemical Attack	
NBC Observe Location	
Artillery Shell	
FLOT	

Figure 20: CVCC Object Type Mapping to M1A2 Detailed Threat Type

3. Overlays

The CVCC Battalion TOC workstation does not receive overlays from the simulation network. Therefore, CVCC overlays are translated into M1A2 overlays, but M1A2 overlays are not translated into CVCC overlays.

3.1 Overlay Types

CVCC systems not classify overlays into types; the M1A2 IVIS systems allow five overlay types. The name of a CVCC overlay is used to determine which M1A2 overlay type to generate. Figure 21 shows the five M1A2 overlay types and the character string which must appear in a CVCC overlay name for it to be translated properly to M1A2.

Overlay Type	CVCC Name
Enemy	ENEMY
Obstacle	OBST
Fire Support	FIRESPT
Operations 1	OPS1
Operations 2	OPS2

Figure 21: M1A2 Overlay Types and CVCC Naming Convention

3.2 Overlay Updates

CVCC systems do not send overlay updates, as the M1A2 systems do. To support this capability the ITRANS will maintain a copy of each overlay translated from CVCC to M1A2. When another overlay of the same type is to be transmitted it will be tagged as an update. The ITRANS will ensure that the M1A2 systems see the overlay as an accurate overlay update.

To send a full overlay (possibly after updates have been sent) the TOC operators must simply create a new overlay. The TOC will give it a new overlay ID and this will tell ITRANS to send out a full overlay.

3.3 Graphic Element Translations

Translation of overlays is accomplished by translating each graphic in an overlay from the CVCC type and format to the M1A2 type and format. Two goals were attempted when mapping the graphics from CVCC to M1A2. First, make the graphics look the same whenever possible. Second, provide a means to create all M1A2 graphics from the CVCC Battalion TOC.

In the M1A2, waypoints (start, passage, coordinating, release, etc.) may be numbered to assist with navigation of the tank. These numbered waypoints may be sent in an overlay. The ITRANS system does not provide a means to generate numbered waypoints for sending to the M1A2 systems. The points themselves may be sent, but it is the responsibility of the tank commander to number the points, if he wishes to use them as waypoints.

The CVCC and M1A2 systems use a type, one or more labels, and a series of points to define each graphic.

Each M1A2 graphic may have up to two labels of ten characters each. The labels are attached to the left and right sides or endpoints of the graphic. The CVCC graphics have a variable number of labels depending on the type of the graphic. The first two labels are translated into the M1A2 labels. If two or fewer labels are used on each graphic, the translation to M1A2 will be consistent.

Each graphic represents either a point, line, or area which is defined by its type. The translation of graphics is discussed in the following sections.

3.3.1 Graphic Point Translations

Figure 22 shows the point type translations.

The point obstacle is used as the default for any graphics which do not have a translation.

All four CVCC TOC symbols are translated to the generic M1A2 headquarters symbol.

In order to create a tank or armored personnel carrier (APC), the appropriate unit symbol with no size designator should be used.

CVCC does not support the Anti-tank Weapon icon, therefore the Anti-armor icon is translated into the Anti-tank Weapon icon.

Finally, two M1A2 graphics cannot be created from the Battalion TOC: threat and medevac. These two graphics are automatically added to overlays when the tank receives a report. The location from a contact, spot, or call for fire report is noted with the threat icon on the enemy overlay and the location from a medevac report is noted with the medevac icon on the first operations overlay.

CVCC	M1A2
Check Point	Critical Point
Linkup Point	
Departure Point	
Traffic Control Point	
Way Point	
Start Point	Start Point
Release Point	Release Point
Coordinating Point	Coordinating Point
Contact Point	Contact Point
Passage Point	Passage Point
Mortar Range Fan	Target Reference Point
Howitzer Range Fan	
Target Reference Point	
Observation Post	Observation Point
Antitank Mine	Anti Personnel Minefield
Antipersonnel Mine	
Mine	
Anti Armor	Anti Tank Weapon
IVIS ATGM	
IVIS PC	APC
IVIS Scout	
BIFV	
CFV	
IVIS Troop	Armor Cavalry Troop
IVIS Tank	Tank
Tank Image	
Heavy Tank	
Armor Bn TOC	Headquarters
Cavalry Squadron TOC	
Infantry TOC	
Mech TOC	
Armor Or Armored Airborne	
Battalion	Armor Battalion
Company	Armor Company
Platoon	Armor Platoon
Task Force	Armor Task Force
Team	Armor Team
Default	Tank
Armored Cavalry	
Squadron	Armor Cavalry Squadron
Battalion	
Company	
Task Force	
Team	
Platoon	Armor Cavalry Platoon
Default	APC

Figure 22: CVCC - M1A2 Point Translation

CVCC	M1A2
Cavalry Or Mech Infantry Or Motorized Infantry Or BIFV Mounted Or Infantry	
Battalion	Mech Infantry Battalion
Company	Mech Infantry Company
Platoon	Mech Infantry Platoon
Task Force	Mech Infantry Task Force
Team	Mech Infantry Team
Default	APC
Abatis	Point Obstacle
IVIS Blown Bridge	
IVIS Abatis	
IVIS Unknown Observation	
ACP	
IVIS Unknown	
IVIS Mortar	
Mortar	
Howitzer	
IVIS Chemical	
IVIS Nuclear	
IVIS Fwair	
IVIS Helo	
IVIS Mech	
IVIS Observer Location	
IVIS Support	
IVIS Truck	
Air Cavalry	
Light Infantry	
Ranger	
Airborne Infantry	
Artillery	
Rocket Artillery	
Surface To Surface	
Howitzer Support	
203mm Howitzer Support	
Target Acquisition	
Engineer	
Bridging	
Topographic Engineer	
Amphibious Engineer	
Survey	
Air Defense	
Surface To Air	
Surface To Air Support	
Helicopter	

Figure 22: CVCC - M1A2 Point Translation (continued)

CVCC	M1A2
Fixed Wing	Point Obstacle (continued)
Armor Trains	
Mech Trains	
Ammo Supply Point	
ALOC	
Signal	
Medical	
Military Police	
CEWI	
IVIS Arty	
IVIS Biological	
Chemical	
Fired Demo	
Mortar Barrage	
Howitzer Barrage	
Nuclear Target	
IVIS Shell	
Helo	

Figure 22: CVCC - M1A2 Point Translation (continued)

3.3.2 Graphic Line Translations

Figure 23 shows the linear graphic translations.

The CVCC multi-point symbols may contain up to 50 points each. When these graphics are translated into equivalent M1A2 graphics, only nine points per symbol are translated.

The M1A2 does not support arrow objects, therefore any CVCC graphics containing arrows (axis of advance, direction of attack, main advance, etc.) are translated into one or more Free Draw symbols which replicate the graphic symbol on the TOC.

The CVCC Linear Target is a multi-point symbol, while the M1A2 Linear Concentration is a two-point symbol. Therefore, the CVCC Linear Target symbol is translated into one or more M1A2 Linear Concentration symbols.

The M1A2 does not support the Coordinated Fire Line, however since it does support the Front Line and Coordinating Point symbols, the CVCC Coordinated Fire Line is translated into two M1A2 Coordinating Points connected by one or more Front Line symbols.

The unspecified obstacle, bridge, and lane graphics cannot be created from the Battalion TOC.

CVCC	M1A2
No Fire Line	Free Draw
Generic Line	
Restricted Fire Line	
Direction Of Advance	
Main Direction Of Advance	
Axis Of Advance	
Main Axis Of Advance	
Boundary Line	
Phase Line	
Generic Area	
Linear Abatis	
Rectangular Target	Engagement Area
Linear Target	Linear Concentration
Unspecified Minefield	Minefield
Anti-tank Minefield	
Antipersonnel Minefield	
Tank Ditch	Anti-tank Ditch
Coordinated Fire Line	Coordinating Points and Front Line
FLOT	Front Line

Figure 23: CVCC - M1A2 Graphic Line Translation

3.3.3 Graphic Area Translations

Figure 24 shows the area translations. CVCC uses spline curves to represent battle positions. M1A2 uses three points to define the size and direction of a battle position. Therefore, all spline curves with a platoon, company, or battalion size designator will be translated into the corresponding M1A2 Battle Position symbol. The point with the size indicator and the two points on either side of it are used to create the M1A2 graphic. If four points are used to define a battle position, the result of the translation to M1A2 is very accurate. If more points are used, the extras are ignored.

CVCC	M1A2 Area
Generic Area	Free Draw
No Fire Area	Free Draw
Spline Curves w/Platoon Indicator	Battle Position - Platoon
Spline Curves w/Company Indicator	Battle Position - Company
Spline Curves w/Battalion Indicator	Battle Position - Battalion

Figure 24: CVCC - M1A2 Graphic Area Translation